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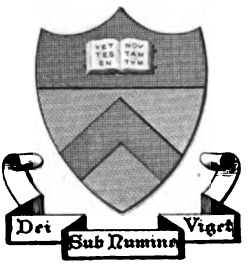

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TABLE OF CONTENTS.

	Page.
Introduction	5
Biology:	
(a) Articles relating to the teaching of biology as a whole	6
(b) Articles on general science with special bearing upon biological subjects	8
(c) Botany	9
(d) Zoology	10
Chemistry	10
Geography	14
Mathematics	18
Nature study	21
Physics	24

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BIBLIOGRAPHY OF SCIENCE TEACHING.

INTRODUCTION.

The following bibliography of science teaching was prepared by a committee of the American Federation of Teachers of the Mathematical and the Natural Sciences, and edited by Professor Richard Elwood Dodge, Teachers College, Columbia University. The following specialists collaborated in selecting and annotating the titles for the several lists: Biology—Professor Otis W. Caldwell, School of Education, University of Chicago, Chicago, Illinois; Chemistry—New England Association of Chemistry Teachers, and Professor John F. Woodhull, Teachers College, Columbia University, New York City; Geography—Professor Ray H. Whitbeck, University of Wisconsin, Madison, Wisconsin; Mathematics—Professor J. W. A. Young, University of Chicago, Chicago, Illinois, and Professor David Eugene Smith, Teachers College, Columbia University, New York City; Nature study—Professor Maurice A. Bigelow, Teachers College, Columbia University, New York City; Physics—New York Physics Club, and Professor John F. Woodhull, Teachers College, Columbia University, New York City. The necessary limitation in the number of items in each field has doubtless led to the omission of many works of value. It will be found, however, that the titles have been carefully selected, and that items here included are really serious contributions to the field.

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59. **Toch, Maximilian.** The influence of chemistry on civilization. Science, 30:697–99, November 19, 1909.

60. **Tyler, John M.** The culture of the imagination in the study of science. School review, 6:716–24, December 1898.

The best order for the student is the necessary order of discovery: conjecture—imagination, logic, and reasoning—test by observation and experiment.

61. **van't Hoff, Jacobus H.** Trans. by **Smith, Alexander.** Physical chemistry in the service of the sciences. Chicago, University of Chicago press, 1903. 126 p. 8°. (Volume 18 of the second series of the Decennial publications.)

62. **Venable, F. P.** A short history of chemistry. Boston, D. C. Heath and company, 1901. viii, 163 p. 12°.

63. **von Meyer, Ernst.** Trans. by **McGowan, George.** A history of chemistry from earliest times to the present day, being also an introduction to the study of the science. New York, The Macmillan company, 1898. xxiv, 631 p. 8°.

64. **Wiechmann, Ferdinand G.** Science sketches: Chemistry, its evolution and achievements. New York, William R. Jenkins, 1899. vii, 176 p. 16°.

Very readable and very good.

65. **Wiley, H. W.** The rôle of chemistry in university education. Science, 16:841–50, November 28, 1902.

66. **Williams, Rufus P.** High school chemistry in its relation to the work of a college course. Science, 18:330–36, September 11, 1903.

67. ———— The planting of chemistry in America. School science and mathematics, 2:75–82, 139–48, April and May 1902.

An historical review of the teaching of chemistry in America.

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68. **Williams, Rufus P.** Teaching of chemistry in schools, 1876–1901. Science, 14:100–4, July 19, 1901.

69. **Woodhull, John F.** The intensive method in chemistry. School science and mathematics, 6:585–88, October 1906.

70. ———— What specialization has done for physics teaching. Science, 31:729–31, May 13, 1910.

Paper read before American association for advancement of science, December 31, 1909.

GEOGRAPHY.

1. **Baber, Zonia.** Field work in the elementary school. Journal of geography, 4:18–22, January 1905.

Enumerates some of the benefits of field work and discusses the difficulties.

2. ———— The scope of geography. Elementary school teacher, 4:257–70, January 1904.

Also in Journal of geography, 4:386–96, November 1905.

A review of the historical development of the study in the last century.

3. **Bagley, William C.** Geography in the intermediate grades. Journal of geography, 4:299–308, September 1905.

Considers methods and devices. A helpful article by one well trained in pedagogy and psychology.

4. ———— The functions of geography in the elementary school: A study in educational values. Journal of geography, 3:222–33, May 1904.

Analyzes the aims and functions of elementary geography and examines the utilitarian and cultural value of the study.

5. **Breeze, Fred J.** High school geography. School science and mathematics, 5:516–19, October 1905.

Takes the ground that high school geography needs humanizing.

6. **Brigham, Albert P.** Geographic influences in American history. Boston, Ginn and company, 1903. xiii, 366 p. 12°.

The shorter of the two recent books which trace the more manifest influences of geography upon the history of our country. Written in an easy and somewhat popular style. Should be read by every teacher of American history and geography. Inexpensive.

7. **Brown, Robert M.** Map reading. Journal of geography, 4:273–88, September 1905. Illus. with ten sketch maps.

8. **Carney, Frank.** Observational work for children. *In* Eighth international geographic congress. Educational section. Report, 1904. p. 966–71.

Also in Journal of geography, 4:12–17, January 1905.

Presents and discusses a method of conducting field lessons.

9. **Carpenter, Frank O.** Commercial geography: The new science. *In* National education association. Proceedings, 1903. [Chicago, Ill., University of Chicago press.] p. 732–37.

Discusses the scope and method of the subject. Demands laboratory work.

10. **Chamberlain, James F.** Some essentials in geography. Journal of geography, 5:369–75, October 1906.

Urges the study of home surroundings and industries, causal relations, the use of maps, globes and pictures. Sufficiently detailed and definite to be really helpful.

11. ———— *chairman.* Report of the committee on secondary school geography. *In* National education association. Proceedings, 1909. [Chicago, Ill., University of Chicago press.] p. 820–28.

Also in Journal of geography, 8:1–9, September 1909.

An analysis of the objection to the type of geography generally taught and a recommendation for the future. The most important report on this subject since that of the Geographical conference of the committee of ten in 1893.

12. **Cook, Jane Perry.** The equipment of a physiographical laboratory. School science and mathematics, 5:421–30, June 1905.

A helpful article with diagrams and cuts showing plans and equipment of such laboratories in Chicago.

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13. **Darling, Frank W.**, *and* **Smith, Elizabeth.** The geography course in the Chicago normal school. Journal of geography, 3:55–64, 122–31, February and March 1904.

Outlines in moderate detail the course of study covered in two terms of fourteen weeks each in the normal school. Distinctly a course for prospective teachers.

14. **Davis, William Morris.** Geographical essays. Ed. by **Johnson, Douglas W.** Boston, Ginn and company, 1908. vi, 777 p. 8°.

A collection of over twenty-five essays, published in various periodicals since 1889. Some of the topics are: An inductive study of the content of geography (1905).—The progress of geography in the schools (1902).—The teaching of geography (1892).—The extension of physical geography in elementary teaching (1892).—Geography in the grammar and primary schools (1893).—Physical geography in the high school: The need of geography in the university (1895).—Physical geography as a university study (1894).—Methods and models in geographical teaching (1889).—Field work in physical geography (1902). There is in America no other such valuable collection of geographical essays on the teaching side of the subject.

15. ———— Home geography. Journal of geography, 4:1–5, January 1905.

"I would urge on every teacher the importance of not only leading pupils to observe accessible facts, but of leading them quickly and readily to perceive the meaning of the facts observed."

16. ———— A scheme of geography. Journal of geography, 3:20–31, January 1904.

Also in The geographical journal, 22 : 413–23, October 1903.

Presents a device for showing graphically the interrelation among groups of ontographic and physiographic facts.

17. **Dodge, Richard Elwood.** Equipment for geography teaching. Journal of geography, 5:242–50, June 1906.

Contains a rather full list of recommended maps, periodicals, school texts, teachers' books and reference books both for teachers and pupils. Publishers' names are given in each instance.

18. ———— Geography for secondary schools. Journal of geography, 6:241–54, 273–85, March and April 1908.

A summary of nineteen replies to a questionnaire sent to a score or more of geographers and teachers of geography in various parts of the country. These replies constitute a most valuable collection of opinions on the question of what ought to be the character of the secondary school geography work. Should be read by every geography teacher in the secondary school. The replies indicate a marked change in sentiment in recent years.

19. ———— Geography for secondary schools. Journal of geography, 7:121–25, February 1909.

Outline of the round table discussion at the meeting of the Association of American geographers in Baltimore, December 1908. The first formulation of the platform of the movement for humanized geography in the secondary schools.

20. ———— Some suggestions concerning a course of study in geography. Journal of geography, 7:7–14, September 1908.

A clear presentation of the principles which underlie a good course in elementary geography. Emphasizes the greater importance of life geography as compared with physical geography in the elementary school.

21. **Dryer, Charles R.** Geography in the normal schools of the United States. Journal of geography, 4:239–43, May–June 1905.

A report upon the conditions of geography teaching in our normal schools. Facts gathered by a questionnaire and from printed catalogues.

22. ———— What is geography? Journal of geography, 4:348–60, October 1905.

A valuable collection of definitions, opinions and quotations from various American and European sources.

23. **Farnham, Amos W.** The course of study in the Oswego (N. Y.) State normal school. Journal of geography, 5:49–65, 109–19, 211–23, 265–77, February, March, May, and June 1906.

Includes the course in the normal school and also that in the practice school. Detailed and logical and prepared by a man who has had long experience in an excellent school.

24. **Fenneman, N. M.** Problems in the teaching of physical geography in secondary schools. Journal of geography, 7:145–57, March 1909.

Discusses the changes within twenty years in both the subject matter and the method of secondary school geography. Gives suggestions for a course in introductory earth science, discusses laboratory work and advocates regional geography or rational commercial geography.

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25. **Genthe, *Mrs.* Martha Krug.** Geographical textbooks and geographical teaching. Journal of geography, 2:227–43, 360–68, May and September 1903.

A scholarly discussion of the fundamental difference in method, in subject matter and in character of textbooks needed by elementary, secondary and mature pupils.

26. ———— Practical exercises to explain the topographic map. Journal of geography, 4:221–26, May–June 1905. Illus.

Helpful in teaching the contour map.

27. **Gibbs, David.** The pedagogy of geography. Pedagogical seminary, 14:39–100, March 1907.

One of our most thorough and scholarly papers on the subject. Deals with: An historical review of geographical textbooks.—An historical review of the methods of teaching geography.—The present status of geography in Europe.—Geography in high schools in the United States.—Geography in our normal schools.—Geography in our technical schools.—Geography in American colleges and universities.—Geography in the elementary schools. Contains a bibliography of ninety-five titles.

28. **Goode, J. Paul.** Commercial geography for secondary schools. Journal of geography, 4:425–32, December 1905.

Also in School science and mathematics, 6 : 569–77, October 1906.

Outlines the field of commercial geography. States the character of the work which should be undertaken in secondary schools. Discusses illustrative material and the teacher's preparation.

29. ———— The human response to the physical environment. Journal of geography, 3:333–43, September 1904.

Also in Elementary school teacher, 4 : 271–82, January 1904.

Discusses the gradual decrease in the control over man exerted by his physical surroundings as he advances in civilization. One of the few available papers on this important phase of modern geography.

30. ———— Rapid memory work. New York teachers' monographs, 5:64–70, June 1903.

The psychology and the advantages of memory map work, with specific application to the continents reduced to their lowest terms.

31. **Gulliver, F. P.** Training in geography. Journal of geography, 5:468–73, December 1906.

Urges observational field studies near home and the making of maps.

32. **Hubbard, George D.** College geography. Educational review, 35:381–400, April 1908.

Discusses The nature of the science, The utility of its subject matter, and Courses of construction.

33. ———— Geography in the secondary schools. *In* National education association. Proceedings, 1908. [Chicago, Ill., University of Chicago press.] p. 978–84.

Defends the cultural value of the study and believes that its value in this respect entitles it to more time than it receives in the high school course.

34. **Jefferson, Mark S. W.** Out-of-door work in geography. *In* National education association. Proceedings, 1904. [Chicago, Ill., University of Chicago press.] p. 583–88.

Also in Journal of geography, 4: 49–57, February 1905.

Gives reasons why out-of-door work is desirable and discusses existing conditions in secondary school geography.

35. **Jones, Edward D.** Sources of literature for commercial geography. Journal of geography, 1:151–55, April 1902.

Gives list of important governmental publications and of commercial and trade journals, with price and place of publication of the latter.

36. **King, Charles F.** Methods and aids in geography. Boston, Lothrop, Lee and Shepard company, 1907. xvi, 525 p. 12°.

A book dealing with the general principles of geography teaching and with many special problems. Gives special emphasis to the Course of study, What to teach on North America, Commercial geography, Mathematical geography, and includes an extensive list of reference books in two chapters, entitled Sources of information and A list of a thousand books.

37. **Kirchwey, Clara B.** Laboratory work in physical geography in secondary schools. Journal of geography, 4:122–30, March 1905.

Favors laboratory work and gives some details of exercises on isotherms, isobars, winds, rainfall, etc.

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38. **McCormick, Henry.** Suggestions on teaching geography. Bloomington, Ill., Public school publishing company, 1899. 169 p. 12°.

A little book of helpful suggestions for young teachers.

39. **McMurry, Charles A.** Excursions and lessons in home geography. New York, The Macmillan company, 1905. ix, 152 p. Illus. 12°.

Chiefly for the third and fourth grades. Contains the subject matter of a large number of "type lessons."

40. ———— Special method in geography. New York, The Macmillan company, 1903. vii, 291 p. 12°.

Outlines a complete course of study from the third through the eighth grade. The plan lays stress on the gradual movement from the home outward, on the strong concentration upon North America and Europe and upon type studies. Contains a graded bibliography.

41. **Marbut, C. F.** Physiography in the university. Journal of geography, 4:23–30, January 1905.

Holds that satisfactory work in the field can be done only when the students map the area studied. Urges the study of models, maps, and photographs. Discusses method of teaching college physiography.

42. **Merrill, J. A.** Physiography in the secondary schools. *In* National education association. Proceedings, 1902. [Chicago, Ill., University of Chicago press.] p. 784–89.

Emphasizes the need of a large proportion of outdoor work.

43. **Mill, Hugh Robert.** Guide to geographical books and appliances. Hints to teachers and students on the choice of geographical books for reference and reading, with classified lists. London, George Philip and son, 1910. viii, 207 p. 8°.

Invaluable reference volume for all teachers. Latest edition is the most complete bibliography of the kind in English.

44. **Redway, Jacques W.** Nature study in the public schools: The geographical phase. *In* National education association. Proceedings, 1900. [Chicago, Ill., University of Chicago press.] p. 411–16.

A plea for elementary observational studies as a part of nature study.

45. ———— The new basis of geography: A manual for the preparation of the teacher. New York, The Macmillan company, 1901. xiv, 229 p. 12°.

Chaps. 7–12 deal especially with the teaching of geography. They treat of The emphasis of essentials, Pictures, models and the globe, Maps and their uses, The course of study, Observation and field work, and The teacher's preparation. Contains a bibliography.

46. **Robinson, Edward Van Dyke.** Economic geography: What it is and what it is not. Publications of the American economic association, 10:April 1909.

Maintains that economic geography is not a part of geography, but a part of economics and can be adequately handled only by an economist.

47. **Salisbury, Rollin D.** The teaching of geography: A Criticism and a suggestion. Educational bimonthly, 3:356–63, June 1909.

Also in Journal of geography, 8: 49–55, November 1909.

Gives questions, with their results, from a test in elementary geography which was given to seventy-five college students in the University of Chicago. Suggests that teachers need to teach more of the useful facts about geography and especially facts of location.

48. **Smith, J. Russell.** Geography in Germany. Journal of geography, 1:420–30, 448–57, November and December 1902.

Describes the geography teaching of the various types of schools in Germany. Gives outlines of courses. Part II deals with university geography in Germany.

49. **Surface, G. T.** Geography in the high school. Journal of geography, 6:348–54, June 1908.

Makes a plea for concrete regional studies and illustrates with a detailed plan for treatment of the Atlantic coastal plain.

50. **Sutherland, William J.** The teaching of geography. Chicago, Scott, Foresman and company, 1909. 292 p. 12°.

A strong and clarifying discussion by an experienced teacher well trained in geography. The analysis of the aims and scope of geography is clean cut. Gives several chapters of practical suggestions for improving the teaching of geography. Contains a bibliography of forty titles of books and papers on the teaching side of the subject, and one hundred and fifty titles on the subject matter side. It is perhaps the best single book for the average teacher.

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51. **Whitbeck, Ray H.** The fundamental and the incidental in geography. Journal of geography, 5:66–73, February 1906.

A discussion of those phases of geography which in the writer's opinion deserve emphasis. Believes that some features of the older geography should be retained.

52. ———— Geography in the elementary schools. *In* National education association Proceedings, 1908. [Chicago, Ill., University of Chicago press.] p. 971–77.

Discusses the relative amount of emphasis to be put upon the physical and commercial phases of the study. Urges map study.

53. ———— Practical work in school geography. *In* Eighth international geographic congress. Report, 1904. p. 1025–29.

Discusses modeling, map drawing, the use of outline maps, diagrams, pictures, museum specimens, the taking of field trips, etc.

54. ———— Secondary school geography: What shall it be? School science and mathematics, 7:579–82, October 1907.

Also in Journal of geography, 6:104–7, October 1907.

A plea for the humanizing of our high school course in geography.

55. **Wolfe, Lloyd E.** The human side of geography. *In* National education association. Proceedings, 1903. [Chicago, Ill., University of Chicago press.] p. 143–53.

A reply to Professor Davis' paper read at the Minneapolis meeting of the Society for the scientific study of education. Maintains that a discussion of some of the processes of manufacture and other industries does belong to elementary geography.

During 1904–05 the Journal of geography published a series of articles on Results to be expected from a school course in geography, by the following authors: Farnham, Amos W., 3:424–27, November 1904.—Redway, J.W., 3: 447–50, December 1904.—Emerson, Philip, 3: 450–54, December 1904.—Winslow, I. O., 3:458–62, December 1904.—Tarr, Ralph S., 4:145–48, April 1905.—Whitbeck, Ray H., 4:149–54, April 1905.—Genthe, Martha Krug, 4:155–59, April 1905.—Jefferson, Mark S. W., 4:160–63, April 1905.—Moore, W. C., 5: 320–25, September 1906.

MATHEMATICS.

1. **American mathematical society.** Report of Committee on Definitions of college entrance requirements in mathematics. Educational review, 26: 305–8, October 1903.

Also in American mathematical society bulletin, 10: 74–77, November 1903.

2. **Ammerman, Charles,** *chairman.* Preliminary report of Committee of Central association of science and mathematics teachers on Algebra in the secondary schools. School science and mathematics, 7: 674–85, November 1907.

Also on Geometry.

3. **Bôcher, Maxime.** The fundamental conceptions and methods of mathematics. Bulletin of American mathematical society, 11:115–35, December 1904.

Discusses carefully various definitions of "mathematics."

4. **Branford, Benchara.** A study of mathematical education, including the teaching of arithmetic. Oxford, The Clarendon press, 1908. xii, 392 p. 12°.

A discussion of the history and teaching of arithmetic, algebra and geometry, based on historical and psychological considerations. Contains a bibliography.

5. **British mathematical association.** Committee on Discussion on reform in the teaching of mathematics. Mathematical gazette (London), 2:129–46, January 1902.

6. **Conférences du Musée pédagogique.** L'enseignement des sciences mathématiques et des sciences physiques. Paris, Imprimerie nationale, 1904. xiv, 179 p. 12°.

Consists of the following lectures with discussion: Liard, L., Les sciences dans l'enseignement secondaire.—Poincaré, H., Les définitions générales en mathématiques.—Lippmann, G., Le but des sciences expérimentales dans l'enseignement secondaire.—Poincaré, L., Les méthodes d'enseignement des sciences expérimentales.—Langevin, P., L'esprit de l'enseignement scientifique.—Borel, Émile, Les exercices pratiques de mathématiques dans l'enseignement secondaire.—Marotte, F., L'enseignement des sciences mathématiques et physiques dans l'ènseignement secondaire en Allemagne.

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7. **Dewey, John.** The psychological and the logical in teaching geometry. Educational review, 25:387–99, April 1903.

Discusses the extent to which strict logic should dominate the early instruction in mathematics.

8. **Fink, Karl.** A brief history of mathematics. Trans. by **Beman, W. W.,** *and* **Smith, D. E.** Chicago, Open court publishing company, 1903. xii, 333 p. 12°

A condensation of Cantor's Geschichte der elementar-mathematik. Covers particularly the history of arithmetic, algebra, geometry and trigonometry, but touches also upon the higher branches.

9. **Jackson, Lambert Lincoln.** The educational significance of sixteenth century arithmetic . . . New York, Teachers college, Columbia university, 1906. 232 p. Illus. 8°. (New York, Teachers college, Columbia university. Contributions to education, no. 8.)

A full historical discussion accompanied by many suggestions for twentieth century instruction.

10. **Keyser, C. J.** Exercises in thinking about number and space: Transition to algebra and geometry. Educational review, 26:246–53, 394–401, 486–93, October, November, and December 1903; 27:36–41, 160–67, 270–78, January, February, and March 1904.

A series of "dialog-exercises" developing certain fundamental notions of the subjects named.

11. **Klein, Felix,** *and* **Reicke, E.** Neue beiträge zur frage des mathematischen und physikalischen unterrichts an den höheren schulen . . . Leipzig und Berlin, B. G. Teubner, 1904. 2 v. in 1. viii, 198 p. 8°.

Important to the student of the German movement for the improvement of the teaching of mathematics. (Young, J. W. A. The movement for the reform in the teaching of mathematics in Prussia. Bulletin of American mathematical society, 12:347–52, April 1906. Also Science, 23:773–78, May 18, 1906)

12. ———— *and* **Schimmack, Rud.** Der mathematische unterricht. Leipzig, B. G. Teubner, 1907. ix, 236 p. 8°. Teil 1. Von der organisation des mathematischen unterrichts.

A course of lectures at the University of Göttingen, 1904–05. Discusses the position of mathematics in the various kinds of German schools, also historically contains much of interest to Americans. A strong and modern book.

13. **Laisant, C. A.** Initiation mathématique. Paris, Librairie Hachette et cie., 1906. vii, 167 p. 16°.

Treats various mathematical recreations and paradoxes not as mere curiosities but from the pedagogic standpoint as introductory to the relevant mathematical topics, ranging from counting to analytic geometry.

14. ———— La mathématique: Philosophie-enseignement. Paris, Georges Carré et C. Naud, 1898. 292 p. 8°.

Discusses the various branches of mathematics from the elements of arithmetic to analytic geometry, mechanics, and the elements of calculus, first from the standpoint of subject matter, then from that of the classroom.

15. **Lodge,** *Sir* **Oliver.** Easy mathematics, chiefly arithmetic. London, 1905. xvi, 436 p. 8°.

An informal discussion of topics of elementary and secondary mathematics that is full of life and suggestions for making the subject interesting.

16. **Loomis, Elisha S.** Original investigation, or how to attack an exercise in geometry. Boston, Ginn and company, 1901. vi, 63 p. 16°.

Discusses various types of proofs with a view to their use in finding other proofs.

17. **McMurry, Charles A.** Special method in arithmetic. New York, The Macmillan company, 1905. vii, 225 p. 16°.

Relates chiefly to questions of primary arithmetic.

18. **Moore, Eliakim H.** The cross-section paper as a mathematical instrument. School review, 14:317–38, May 1906.

A detailed presentation of specific ways in which cross-section paper can be systematically used as a unifying element in mathematics.

19. ———— The foundations of mathematics. Presidential address at annual meeting of American mathematical society, New York, December 29, 1902. Bulletin of American mathematical society, 9:402–24, May 1903.

Also in Science, 17:401–16, March 13, 1903; School review, 11:521–38, June 1903.

Discusses the fundamental notions of mathematics and the problems of instruction. Suggests various lines of action looking toward improvement in the teaching of mathematics.

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20. **Myers, G. W.** A class of content-problems for high school algebra. School review, 14:563–77, October 1906.

Specific instances of algebraic problems resulting from various loading of beams and the like.

21. ———— Mathematics in the university high school. School review, 14:57–64, January 1906.

Outline of topics of a correlated course for the first two years in a high school. Report on the classroom experiences with the above.—The year's progress in the mathematical work of the university high school. School review, 15 : 576–93, October 1907.

22. **Newhall, C. W.** A high school mathematics club. Educational review, 29:515–22, May 1905.

Details of organization and program.

23. **Osborn, Clinton S.** Thought values in beginning algebra. School review, 10:169–84, March 1902.

Stenographic reports of actual lessons, with comments.

24. **Packard, John C.** Mathematics and the co-ordination of mathematics and physics in secondary schools. School review, 11:798–807, December 1903.

A concrete discussion of proposed omissions and additions.

25. **Perry, John,** *ed.* Discussion on the teaching of mathematics which took place on September 14th, at a joint meeting of two sections: Section A.—Mathematics and physics. Section L.—Education . . . to which is now added the Report of the British association committee drawn up by the chairman. Prof. Forsyth. [2d ed.] London, Macmillan and company, limited, 1902, vi, 123 p. 8°.

Opinions of teachers concerning the "Perry movement." Calls for more concrete and practical teaching, for the earlier use of more advanced methods and results.

26. ———— England's neglect of science. London, T. Fisher Unwin, 1900. vii, 113 p. 8°.

The origin of the "Perry movement" for more genuine applied mathematics.

27. **Pringsheim, Albert.** Ueber wert und angeblichen unwert der mathematik . . . München, verlag der K. B. Akademie, in kommission des G. Franz'schen verlags (J. Roth) 1904. 44 p. 8°.

28. **Reidt, F.** Anleitung zum mathematischen unterricht an höheren schulen. Berlin, G. Grote'sche verlagsbuchhandlung, 1886. x, 252 p. 8°.

Covers the elementary and secondary field. Though intended primarily for Germans, the work contains much of general interest.

29. **Smith, David Eugene.** L'enseignement des mathématiques dans les écoles secondaires aux États-Unis. Paris, Gauthier-Villars; [etc., etc.] 1908. [269]–284 p. 8°.

"Extrait de l'Enseignement mathématique, no. 4, 10 année, juillet 1908."

Paper read before the Fourth international congress of mathematicians, Rome, April 1908. Explanation of the school systems and the mathematical course in America, with suggestions of reform.

30. ———— The question of problems in elementary mathematics. Educational review, 31:300–5, March 1906.

A summary of the pros and cons of applied and misapplied (merely manipulation) problems and prognostications as to the future trend of usage.

31. ———— The teaching of arithmetic. Teachers college record, 10:1–100, January 1909.

A résumé of some of the more important questions in the teaching of arithmetic, with a discussion of the course of study.

32. ———— The teaching of elementary mathematics. New York, The Macmillan company, 1900. xv, 312 p. 12°.

Discusses the teaching of mathematics in elementary and secondary schools, both from the historical standpoint and from that of present day practice and needs. Full bibliographic references.

33. ———— *and* **McMurry, F. M.** Mathematics in the elementary school. Teachers college record, 4:70, March 1903.

Detailed outline of a course in arithmetic in the various grades.

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34. **Stone, Cliff Winfield.** Arithmetical abilities and some factors determining them. New York, Teachers college, Columbia university, 1908. 101 p. 8°. (Columbia university contributions to education. Teachers college series, no. 19.)

A psychologico-statistical investigation of the abilities of sixth year pupils in certain typical schools.

35. **Story, W. E.** The unification of mathematics in the school curriculum. School review, 11:832–55, December 1903.

Calls for the treatment of elementary mathematics as one subject, in a connected, consequent, and progressive way, as an art as well as a science.

36. **Tannery, Jules.** Notions des mathématiques. Paris, Librairie Ch. Delagrave, 1903. x, 370 p. 16°.

A review at the close of the secondary course. Suggestive along the lines of interrelation of algebra and geometry and the early use of the idea of derivations.

37. **Tropfke, Johannes.** Geschichte der elementar-mathematik in systematischer darstellung. Leipzig, Veit und comp., 1903. viii, 496 p. 8°.

Covers the ground from the elements of arithmetic to analytic geometry, inclusive. Topically arranged, usable and thorough.

38. **Wisconsin state teachers' association.** Report of Committee on The content of algebra for high schools. Bulletin of information 14. Also a revision of the content of geometry for high schools. Bulletin 12. (Issued by State supt. C. P. Cary, Madison, Wis.)

39. **Young, J. W. A.** The teaching of mathematics in the elementary and the secondary school. New York, Longmans, Green and company, 1907. xviii, 351 p. 12°.

Scope indicated by title. Contains twelve bibliographies at the beginning of chapters, numerous other references in the text and (p. 156–59, 171–75) lists of books for the teacher and the library

40. ———— The teaching of mathematics in the higher schools of Prussia. New York, Longmans, Green and company, 1900. xiv, 141 p. 16°.

Treats the organization of these schools in general, the teaching of mathematics in detail, and the suggestions this work offers to Americans.

NATURE STUDY.

1. **Bailey, Liberty Hyde.** The nature study idea. New York, The Macmillan company, 1909. ix, 246 p. 12°.

A collection of essays on nature study as a phase of education. Contains numerous practical suggestions for teachers.

2. ———— The outlook to nature. New York, The Macmillan company, 1905. ix, 296 p. 12°.

A collection of essays valuable for the point of view expressed.

3. **Bigelow, Edward Fuller.** How nature study should be taught . . . New York, Hinds, Noble and Eldredge [1904]. xxi, 203 p. front., plates. 12°.

A collection of essays intended to give teachers inspiration, general direction, and outlook regarding nature study.

4. **Burkett, C. W., Stevens, F. L.,** *and* **Hill, D. H.** Agriculture for beginners. Boston, Ginn and company, 1903. xii, 267 p. Illus. 12°.

Most of the many books on elementary agriculture are distinctly adapted to secondary schools, but this book has much material in line with nature study.

5. **Burroughs, John.** A year in the fields. Boston and New York, Houghton, Mifflin and company, 1896. ix, 220 p. 12°.

Valuable from the point of view of a nature observer.

6. Cornell university nature study leaflets. Albany, N. Y., The J. B. Lyon company. 607 p. Illus. 8°.

A collection of the leaflets published from 1896–1904.

7. **Coulter, J. M.,** *and* **J. G.,** *and* **Patterson, Alice J.** Practical nature study. New York, D. Appleton and company, 1909. ix, 354 p. 12°.

A discussion of principles, topical outlines, and lesson plans for nature study and elementary agriculture.

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8. **Cummings, H. H.** Nature study by grades: Teachers' book for primary grades. New York, American book company, 1908. 180 p. 12°.

A very helpful series of lessons adapted to primary schools in widely separated localities.

9. **Dearness, J.** How to teach the nature study course. Toronto, Copp, Clark and company, 1905. 206 p. 8°.

Intended for Canadian schools, but very suggestive for teachers elsewhere.

10. **Goodrich, C. L.** The first book of farming. New York, Doubleday, Page and company, 1905. xx, 259 p. 12°.

An excellent introduction to principles of gardening and the plant side of agriculture.

11. **Guyer, M. F.** The question of method in nature study. Pedagogical seminary, 12:86–92, March 1905.

Also in Nature study review, 3: 228–35, November 1907.

12. Hampton Leaflets. Hampton, Va., Hampton institute, Nature study bureau. About 50 cents per dozen. Illus.

A valuable series of leaflets dealing with nature study and agriculture. Published monthly.

13. **Hemenway, H. D.** Hints and helps for young gardeners. Hartford, Conn., pub. by the author, 1906. 58 p.

14. ——— How to make school gardens. New York, Doubleday, Page and company, 1903. xvi, 107 p. Illus. 12°.

A manual useful for teachers unfamiliar with gardening.

15. **Hodge, C. F.** Nature study and life. Boston, Ginn and company, 1902. xvi, 514 p. Illus. 12°

One of the two best known books on nature study. A brief discussion of principles in the first chapters is followed by many chapters dealing with biological materials in an interesting and suggestive style.

16. **Holtz, F. L.** Nature study. New York, Charles Scribner's sons, 1908. xiv, 546 p. Illus. 12°.

The first part deals with general principles, the second part with subject matter, chiefly biological. A very practical book for teachers in training and others who have had no training in nature study materials and methods.

17. Illinois leaflets on agriculture. Taylorville, Ill., C. M. Parker. Pub. monthly. 25 cents per year.

An extensive series of leaflets on agriculture by professors of the University of Illinois, full of useful suggestions.

18. **Jackman, Wilbur S.** Nature study for grammar grades: A manual for teachers and pupils below the high school in the study of nature. New York, London, The Macmillan company, 1901. 407 p. 12°.

Several books with similar titles were published by this author, all of which are out of line with the present interpretation of nature study, but are useful for reference in preparing outlines and lesson plans.

19. **Jenkins, Oliver P.**, *and* **Kellogg, Vernon L.** Lessons in nature study. San Francisco, The Whitaker and Ray company, 1900. 191 p. Illus. 12°.

A collection of lesson plans chiefly on plants and animals, but some on physical nature study.

20. **Lange, Dietrich.** Handbook of nature study, for teachers and pupils in the elementary schools. New York and London, The Macmillan company, 1898. xvi, 329 p. Illus. 12°.

Suggestions regarding materials, chiefly biological, profitable for nature lessons, especially in the eastern part of North America.

21. **Lloyd, Francis E.**, *and* **Bigelow, Maurice A.** The teaching of biology in the secondary school. New York [etc.], Longmans, Green and company, 1904. viii, 491 p. 12°. (American teachers' series.)

See chapter 2 on Nature study.

22. Massachusetts nature leaflets. Boston, State board of agriculture. Illus.

Issued serially for a number of years.

23. **McMurry, Charles A.** Special method in elementary science for the common school. New York and London, The Macmillan company, 1905. ix, 275 p. 12°.

A discussion of principles, outline of course, list of books, and suggestive lesson plans. The discussion of principles and methods of teaching is the most valuable part of the book.

24. **McMurry, Lida B.** Nature study lessons. New York, The Macmillan company, 1905. xi, 191 p. 12°.

A suggestive series of lessons for primary grades.

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25. **Munson, John P.** Education through nature study, foundations and method. New York and Chicago, E. L. Kellogg and company [1903]. 297 p. Illus., diagrs. 12°.

A discussion of principles, methods, and materials. Most of this work is out of line with the most approved nature study to-day and resembles high school biology.

26. **National education association of the United States. National council of education.** Report of the Committee on industrial education in schools for rural communities, July 1905. [n. p.] The Association, 1905. 97 p. 8°.

27. **Nature study review.** Pub. at Urbana, Ill., by American nature study society. $1.00 per year, 9 nos.

Founded in 1905 and now the official organ of the American nature study society. The following articles on the educational aspects of nature study are among the most important published in this magazine:

Aims, values, and principles of nature study. A symposium. Coulter, S.; Fairbanks, H. W.; Bigelow, M. A. 1:49-61, March 1905.

Aims and methods in nature study. Downing, E. R.; Guyer, M. F. 3:162-67, 221-35, September and November 1907.

Criteria of selection of material for the teaching of nature study and geography. Caldwell, Otis W. 3:252-59, December 1907.

Industrial education and nature study. A symposium. Caldwell, Otis W.; Bonser, Frederick G.; Johnson, J. T.; Farnham, Amos W.; Mann, C. R.; Baldwin, W. A.; Robison, C.H.; Shepherd, John Wilkes. 5:2-28, January 1909.

Nature study and manual training. Bigelow, M. A.; Baldwin, W. A. 2:41-48, 91-96, February and March 1906.

Nature study and science. A symposium. Coulter, Stanley; Hodge, C. F.; Mann, C. R.; Bigelow, M. A.; Clements, F. L.; Praeger, W. E.; Coulter, J. G.; Shepherd, J. W.; Charles, F. L.; McCready, S. B.; Meyers, I. B.; Bigelow, M. A. (editorial review) 4:10-24, 33-51, January and February 1908.

Nature study as related to agriculture. A symposium. Hays, W. M.; Comstock, A. B.; Stevens, F. L.; MacKay, A. H.; Dearness, J.; Davenport, E. 1:141-53; 4:261-64; 5:2-28, July 1905, December 1908, and January 1909.

Organization of nature study in primary grades. Davis, B. M. 4:102-10, April 1908.

School gardens. Hemenway, H. D.; Thayer, Edna R.; Croswell, T. R.; Parsons, Fannie G.; Hatch, Luther A.; Weed, Clarence M.; Fisher, Ruth B.; Miller, Louise K.; Bigelow, M. A.; Balthis, Frank K. 1:29-36, 61-68, 255-61; 3:196-99; 4:75-84, 276-82, January, March, and November 1905; October 1907; March and December 1908.

The established principles of nature study. Bigelow, M. A.; Hodge, C. F. 3:1-8, January 1907.

The place of physiology in the curriculum of the elementary school. Bigelow, M. A.; Blair, F. G. 2:67-72; 4:239-60, February 1906, and December 1908.

The relation of geography to nature study in the elementary school. Coulter, J. M. 1:173-98, March 1905.

The relation of nature study and natural science. A symposium. Fairbanks, H. W.; Hodge, C. F.; MacBride, T. H.; Stevens, F. L.; Bigelow, M. A. 1:2-18, January 1905.

Training teachers of nature study. A symposium. Wilson, L. L. W.; Brown, Bertha M.; Boyden, A. C.; Downing, E. R.; Munson, J. P.; Charles, F. L.; Coleman, W.; Sinclair, S. B.; Guyer, M. F.; Shepherd, N. S.; Dellinger, O. P.; Bigelow, M. A.; Coulter, S.; Burns, L. B.; Trafton, G. H.; Shepherd, J. W.; Dearness, J.; Cummings, H. H.; Patterson, Alice J.; Hargitt, Dora. 2:122-35; 4:173:92, April 1906, and September 1908.

28. **Overton, Frank,** *and* **Hill, Mary E.** Nature study; A pupil's textbook. New York, Cincinnati [etc.], American book company [1905]. 142 p. Illus. 12°.

Lessons for a year's study of common objects.

29. Purdue university leaflets. Lafayette, Ind.

A valuable series, but not complete for distribution.

30. **Schmucker, S. C.** The study of nature. Philadelphia, The Lippincott company, 1908. 315 p. Illus. 12°.

Chiefly deals with biological materials and schoolroom management, but has a few chapters on principles. Useful for student-teachers.

31. **Scott, Charles B.** Nature study and the child. Boston, D. C. Heath and company, 1901. xxv, 618 p. Illus. 12°.

A discussion of aims and principles of nature study, and also has practical suggestions and detailed outlines for some lessons.

32. **Wilson,** *Mrs.* **Lucy L. W.** Nature study in elementary schools. New York and London, The Macmillan company, 1907. xix, 272 p. Illus. 16°.

A practical manual arranged according to materials available by months.

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1. **Ames, J. S.** Henry Augustus Rowland. Science, 13:681–84, May 3, 1901.
2. **Andrews, C. H.** The efficiency in the teaching of physics. *In* Eastern association of physics teachers. Proceedings, December 1905. p. 7–24. (Name and address of secretary published annually in School science and mathematics.)
   Note particularly the diversity of interest and information needed by a physics teacher.
3. **Baekeland, L. H.** The danger of overspecialization. Science, 25:845–54, May 31, 1907.
   "I challenge you to name any truly great man who was merely a specialist—one-sided pursuits are apt to make us very narrow minded." "Overspecialized science is apt to degenerate into a mere hobby where all conceptions of true proportions and harmony are lost."
4. **Bailey, L. H.** The teaching of science. *In* State science teachers' association. Proceedings, 12th annual meeting, 1907. Albany, University of the state of New York, 1908. p. 110–15. (Education department. Bulletin, no. 431, September 15, 1908.)
   Distinguish between the teaching function and the research function. We are teachers. It is our business to open the minds of the young to the facts of science.
5. **Balliet, Thomas M.** The influence of the present methods of graduate instruction on the teaching in secondary schools. School review, 16:217–25, April 1908.
6. **Cajori, Florian.** A history of physics in its elementary branches, including the evolution of physical laboratories. New York, The Macmillan company, 1899. viii, 322 p. 12°.
7. **Carnegie, Andrew.** James Watt. New York, Doubleday, Page and company, 1905. 241 p. 8°.
8. **Chute, H. N.** A high school library for physics. School science and mathematics, 1:126–30, May 1901.
   The value of outside reading versus laboratory work, and a list of books.
9. **Collar, William C.** Opportunities due the secondary school teacher of physics. School science and mathematics, 7:574–78, October 1907.
   Also in Eastern association of physics teachers. Proceedings, March 1907.
10. **Coulter, John M.** What the university expects of the secondary school. School review, 17:73–84, February 1909.
11. **Dean, John Candee.** Count Rumford. Popular science monthly, 73:32–51, July 1908. Illus.
12. **Denslow, Van Buren,** *and* **Parker, Jane Marsh.** Thomas A. Edison and Samuel F. B. Morse. New York, Cassell and company, 1887. 128 p. 12°.
13. **Dewey, John.** Science as subject matter and as method. Science, 31:121–27, January 28, 1910.
    Read before the American federation of teachers of the mathematical and the natural sciences, December 1909.
14. **Fahie, J. J.** Galileo, his life and work . . . London, J. Murray, 1903. xiv, 451 p. Illus. 8°.
15. **Franklin, Benjamin.** Autobiography. New York, Cassell and company, 1886. 734 p. 24°.
16. **Franklin, William S.** The study of science by young people. *In* New York state science teachers' association. Proceedings, 12th annual meeting, 1907. Albany, University of the state of New York, 1908. p. 65–94. (Education department. Bulletin no. 431, September 15, 1908.)
    "My experience is, most emphatically, that a student may measure a thing and know nothing at all about it, and I believe that the present high school courses in elementary physics in which quantitative laboratory work is so strongly emphasized are altogether bad—I believe that physical sciences should be taught in the secondary schools with reference primarily to their practical applications—I can not endure a so-called knowledge of elementary science which does not relate to some actual physical condition or thing—either you must create an actual world of the unusual phenomena of nature by purchasing an elaborate and expensive equipment of scientific apparatus, or you must make use of the boy's everyday world of actual conditions and things."

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17. **Garnett, William.** Heroes of science—physicists. New York, E. and J. B. Young and company, 1885. vii, 339 p. 16°.
Popular and accurate.

18. **Glazebrook, R. T.** James Clark Maxwell and modern physics. New York, The Macmillan company, 1896. vii, 224 p. 16°.

19. **Gray, Andrew.** Lord Kelvin—an account of his scientific life and work. New York, E. P. Dutton and company, 1908. ix, 319 p. 16°.

20. **Hall, E. H.** The relation of colleges to secondary schools in respect to physics. Science, 30:577–86, October 29, 1909.

21. **Henderson, W. D.** The present status of high school physics. School science and mathematics, 8:347–59, May 1908.

22. **Hill, G. W.** Professor Simon Newcomb as an astronomer. Science, 30:353–57, September 17, 1909.

23. **Hopkins, Arthur T.** The pedagogical bearing of chemistry on physics. School science and mathematics, 4:22–30, April 1904.

24. **Jordan, David Starr.** The high school course. Popular science monthly, 73:28–31, July 1908.
"For colleges to specify certain classes of subjects regardless of the real interest of the secondary schools and their pupils is a species of impertinence which only tradition justifies.—In general the high school graduate who has a training worth while in the conduct of life is also well fitted to enter college for further training.—The average American boy quits the high school in disgust because he can not interpret its work in terms of life."

25. **Lewis, W. D.** College domination of high schools. Outlook, 93:820–25, December 11, 1909.

26. **Lodge, *Sir* Oliver.** Pioneers of science. New York, The Macmillan company, 1893. xv, 404 p. 12°.

27. **McAndrew, William.** The college influence on public high schools. School bulletin, 36:89–93, January 1910.

28. **Mann, C. R.** The aims and tendencies in physics teaching. School science and mathematics, 6:723–30, December 1906.

29. ———— American federation of teachers of the mathematical and the natural sciences. School science and mathematics, 7:242–43, March 1907; 8:78, 335–37, 432–33, January, April, and May 1908.

30. ———— Histories and biographies of physics. Science, 16:1016–21, December 26, 1902.

31. ———— The meaning for the movement for the reform of science teaching. Educational review, 34:13–25, June 1907.

32. ———— The new movement among physics teachers. School science and mathematics, 6:198–202, 696–702, 787–94, March, November, and December 1906; 7:328–34, April 1907; 8:522–25, June 1908.
Also in School review, 14:212–16, 429–37, 652–59, 746–53, March, June, November, and December 1906; 15:290–98, April 1907.

33. ———— The new movement for the reform of physics teaching in Germany, France, and America. *In* New York state science teachers' association. Proceedings, 11th annual conference, 1906. Albany, University of the state of New York, 1907. p. 75–99. (State education department. Bulletin, no. 34, August 1907.)

34. ———— On science teaching. School science and mathematics, 5:546–51, 617–22, 685–90, October, November, and December 1905; 6:25–35, 194–97, 303–9, January, March, and April 1906.

35. ———— The physics teacher's problem. Science, 29:951–62, June 18, 1909.

36. ———— Physics teaching in the secondary schools of America. Science, 30:789–98, December 3, 1909.

37. ———— Science in civilization and science in education. School review, 14:664–70, November 1906.

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38. **Massachusetts. Board of education. Report.** The relation of the Massachusetts high schools to community needs. [Massachusetts state board of education.] 1906–07. p. 317–46.

39. **Mead, George H.** Science in the high school. School review, 14:237–49, 1906.
Discussed by Moulton, F. R., p. 249–50.—Millikan, R. A., p. 250–52.—Barnes, C. R., p. 252–53.
Some inclusion of the old natural history would improve the present course. Too much abstract mathematics.

40. **Millikan, Robert A.** The relation of high school and college physics. *In* Eastern association of physics teachers. Proceedings, October 23, 1908. p. 2–18. (Name and address of secretary published annually in School science and mathematics.)

41. **Munroe, James P.** How the colleges ruin the high schools. World's work, 18:11541–44, May 1909.

42. ———— The specialist blight on American education. Popular science monthly, 73:340–44, October 1908.
"Men in the professions have seemingly gone mad upon the question of specialization.—Many a green tree of scholarship, many a fair, broad field of general culture has been converted into a naked waste of narrow pedantry."

43. **New York physics club.** Recommendations concerning examinations in physics. School science and mathematics, 8:368, May 1908.
Also in a pamphlet published by the club, which contains a proposed syllabus. p. 12, April 1908.

44. **Nichols, Edward L.** Physics teaching in the secondary schools—past, present, and future. *In* Eastern association of physics teachers. Proceedings, December 1905. p. 38–44. (Name and address of secretary published annually in School science and mathematics.)

45. **Nichols, Ernest F.** Physics. Popular science monthly, 72:323–36, April 1908.
A public lecture delivered at Columbia university on the present state of our knowledge of physics.

46. **Ostwald, Wilhelm.** A great chemist's career. Trans. from Reclams universum. Scientific American supplement, 65:137, February 29, 1908.

47. **Packard, John C.** Applied science. Laboratory exercises for the chemistry class. New England journal of education, 64:560, November 22, 1906; 66:467, 572–73, 598–99, 692–93, October 31, November 28, December 5, and December 26, 1907.
Very suggestive and helpful to all teachers of physics.

48. ———— High school physics. Education, 30:512–17, April 1910.

49. ———— Physics for boys and girls: An introductory course. School science and mathematics, 3:241–42, October 1903.

50. **Pyle, Willard R.** Illustrations and applications in the teaching of physics. School science and mathematics, 8:505–10, June 1908.

51. **Radot, Valery.** Trans. by **Hamilton,** *Lady* **Claud.** Louis Pasteur: his life and labors . . . New York, D. Appleton and company, 1886. xlii, 300 p. 12°.

52. **Rollins, Frank.** Syllabuses and examinations in physics. Educational review, 34:347–64, November 1907.
Opposes mere descriptive and qualitative work.

53. **Routledge, Robert.** Popular history of science. London, George Routledge and sons, 1881. 461 p. 12°.

54. **Snedden, David Samuel.** Educational tendencies in America. Educational review, 39:13–31, January 1910.
"All education seems to inherit a fundamental tendency toward the abstract, the relatively unreal, the bookish. The teaching of science has done something to correct this, but even here there seems to be a persistent disposition to wander out of the sunlight."

55. **Spaulding, Frank B.** The culture aim in physics teaching. School science and mathematics, 10:14–17, January 1910.

56. ———— What knowledge (of physics) is of most worth? School science and mathematics, 8:674–79, November 1908.

57. **Stark, William E.** A retrospect and a vision. School science and mathematics, 9:284–90, March 1909.
Experience as a teacher of physics.

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58. **Stradling, George F.** A teacher's index of current physical literature. School science and mathematics, 1:18–19, March 1901.

An easy method to keep in touch with modern periodical literature.

59. Symposium on The purpose and organization of physics teaching in secondary schools. School science and mathematics, 8: January 1908; 9: January, February, and March 1909.

Authors represented in symposium as follows: Avery, Lewis B.—Baldwin, J. Mark.—Butler, Nicholas M.—Chute, H. N.—Crew, Henry.—Dewey, John.—Hall, G. Stanley.—Michaelson, Albert A.—Millikan, R. A.—Strong, E. A.—Terry, H. L.—Twiss, George R.—Woodhull, John F.

60. **Terry, H. L.** The new movement in physics teaching. Educational review, 37:12–18, January 1909.

61. **Thompson, Silvanus P.** Life of William Thomson, Baron Kelvin of Largs. New York, The Macmillan company, 1910. I, xx, 1–584 p.; II, xi, 585–1297 p. 8°.

"A record of no small portion of the scientific achievements of the nineteenth century."

62. ———— Michael Faraday: His life and work. New York, The Macmillan company, 1898. xii, 308 p. 16°.

63. **Thorndike, Edward L.** Science teaching seen from the outside. *In* New York state science teachers' association. Proceedings, 11th annual conference, 1906. p. 69–74. Albany, University of the state of New York, 1907. (State education department. Bulletin, no. 34, August 1907.)

64. **Thorpe, T. E.** Humphry Davy, poet and philosopher. New York, The Macmillan company, 1896. vii, 240 p. 12°.

65. **Thurston, Robert H.** Robert Fulton: His life and its results. New York, Dodd, Mead and company, 1891. 194 p. 16°.

66. **Tyndall, John.** Faraday as a discoverer. New York, D. Appleton and company, 1874. viii, 171 p. 12°.

67. **Webster, Arthur Gordon.** Lord Kelvin. Science, 27:1–8, January 3, 1908.

68. **Weld, Charles Richard.** A history of the Royal society with memoirs of the presidents, compiled from authentic documents. London, John W. Parker, 1848. I, xx, 527 p.; II, viii, 611 p. 8°.

69. **Whitman, W. G.** A physics course for girls. School science and mathematics, 9:146–48, February 1909.

70. **Williams, Henry Smith.** The story of nineteenth century science. New York, Harper and brothers, 1901. viii, 475 p. 8°.

71. **Wilson, George.** The life of the Hon. Henry Cavendish, inc. abstracts of his more important scientific papers and a critical inquiry into the claims of all the alleged discoverers of the composition of water. London, printed for the Cavendish society, 1851. xiv, 478 p. 8°.

72. **Woodhull, John F.** The enrichment of the high school course in physics. *In* Eastern association of physics teachers. Proceedings, November 1904. p. 7–12.

Also in School science and mathematics, 5 : 223–29, April 1905.

73. ———— How the public will solve our problems of science teaching. School science and mathematics, 9:267–80, March 1909.

74. ———— The modern trend of physics and chemistry teaching. Educational review, 31:236–47, March 1906.

75. ———— Science for culture. School science and mathematics, 7:83–93, February 1907.

Also in School review, 15 : 123–33, February 1907.

76. ———— The significance of the requirements in physics of the college entrance examination board. School science and mathematics, 10:34–42, January 1910.

77. ———— The teaching of physical science. Teachers college record, 11:1–82, January 1910.

Contains various aims and methods suggested in the preface of nearly every elementary textbook.

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OPPORTUNITIES FOR GRADUATE STUDY IN AGRICULTURE IN THE UNITED STATES

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CONTENTS.

	Page.
Introduction	5
Rural economics and sociology—Farm management	6
Agricultural chemistry	7
Agronomy	8
Soils and fertilizers	8
Botany	9
Plant physiology	10
Plant pathology	10
Bacteriology	11
Plant breeding	11
Horticulture	12
Forestry	12
Agricultural engineering, drainage, and irrigation	13
Landscape gardening	13
Zoology	13
Entomology	14
Animal husbandry	14
Physiology and physiological chemistry	15
Animal nutrition	16
Dairying	16

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OPPORTUNITIES FOR GRADUATE STUDY IN AGRICULTURE IN THE UNITED STATES.

INTRODUCTION.

This bulletin, describing the opportunities in the United States for graduate study in agriculture and those closely allied sciences which have a direct application in agriculture, is the result of an inquiry made by the Bureau of Education in cooperation with the committee on graduate study of the Association of American Agricultural Colleges and Experiment Stations. The inquiry was confined to the agricultural and mechanical colleges, the State universities, and the institutions represented in the Association of American Universities. The bulletin lists courses offered for graduate students only and also those courses open to advanced undergraduates which may be taken by graduate students as major subjects for advanced degrees. No course is listed from any institution whose entrance requirements for 1911 are less than 14 units of high-school work—that is, the equivalent of the standard four-year high-school course—with the exception of the agricultural colleges of the University of Tennessee and Ohio State University, both of which require 12 units for admission.

The subject matter of this bulletin is grouped under 19 headings, under which are included the names of the institutions offering courses on some phase of the subjects indicated in the headings. Following the names of the institutions are statements intended to indicate the scope of the work offered by the institution rather than the exact titles of the individual courses. As a supplementary statement to the courses listed, it may be said that opportunity for original study, investigation, and research on special topics is given under certain restrictions by most of these colleges. Under the headings botany, zoology, and the other general sciences, only such courses are listed as seem to have a direct bearing upon agriculture and may therefore be regarded as agricultural-science courses. Many courses are given under two separate headings where such cross reference seems likely to be helpful.

Forty-three of the State agricultural and mechanical colleges, commonly known as the "land-grant colleges," offer graduate work to

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their own graduates and to the graduates of other institutions whose degrees are equivalent to their own. Many of the colleges whose courses are not included in this bulletin, owing to their low entrance requirements, have excellent equipment and facilities for research and investigation along a few special lines.

The following institutions require special mention:

The *Bussey Institution* (Harvard University) is an institution for advanced instruction and research in subjects relating to agriculture and horticulture, emphasizing especially economic entomology, animal heredity, and experimental plant morphology.

The *Institute of Animal Nutrition* (The Pennsylvania State College) is a research institution affiliated with the school of agriculture and experiment station, for the study of fundamental questions relating to the physiology of nutrition with exceptional facilities for advanced graduate study in animal nutrition. Its equipment includes a respiration calorimeter for domestic animals, of a size sufficient for experiments on mature cattle.

The *Audubon Sugar School* (Louisiana State University), located at New Orleans, offers a five-year course in sugar raising, sugar manufacturing, sugar analysis, and in sugarhouse engineering; the work of the last two years of this course is essentially professional and may be taken by graduate students.

The *Forest Products Laboratory* (University of Wisconsin), equipped and maintained by the United States Forest Service for experimental work in testing various woods for all purposes, offers facilities for advanced graduate study to students of the university.

In addition to the subjects listed in the following pages, the University of California offers advanced undergraduate work open to graduates in sugar technology, which includes lecture and laboratory courses dealing with the practical methods of field, factory, and laboratory management in the manufacture of beet sugar; also in the wine industry, which includes courses in vinification, zymology, analysis of must and wine, and the microscopical, physiological, and chemical examination of wine. The University of Wisconsin offers courses for graduates and advanced undergraduates in theoretical and practical meteorology and in climatology.

RURAL ECONOMICS AND SOCIOLOGY—FARM MANAGEMENT.

University of California: Advanced undergraduate courses in farm management, open to graduates.

University of Illinois: Research course in farm organization.

University of Chicago, Ill.: Two courses in summer quarter: Problems of American agriculture; farm organization and management.

Harvard University, Mass.: A half-year course in economics of agriculture and a half-year course in rural social development.

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University of Minnesota: A reading and research course in farm management; economics of forestry and irrigation; history and literature of agricultural industries; economics of agricultural industries.

University of Missouri: A half-year course in social conditions in agricultural communities.

University of Nebraska: A course in farm management and a course in farm accounting.

Cornell University, N. Y.: Research course in rural economics and social problems; a lecture course in farm management; research course with seminar in farm management.

Ohio State University: Research course in farm management and in agricultural economics.

University of Wisconsin: Two half-year courses: Historical and comparative agriculture; research course in agricultural economics.

AGRICULTURAL CHEMISTRY.

University of California: Laboratory research course in general agricultural chemistry; research course in chemico-agricultural technology; research in physiological chemistry; advanced undergraduate courses in chemical biology; analysis of must and wines; dairy, food, and fertilizer chemistry; insecticides and fungicides.

Georgia State College of Agriculture and Mechanic Arts: Advanced agricultural analysis of soils, fertilizers, and feed stuffs.

University of Illinois: Advanced organic chemistry; advanced physiological chemistry; animal chemistry; special research courses in organic and animal chemistry; food analysis; water analysis; advanced agricultural analysis; chemistry of fertilizers; proximate organic analysis.

Purdue University, Ind.: Advanced agricultural analysis; dairy chemistry.

Iowa State College: Advanced agricultural analysis.

University of Kansas: Sugar analysis; water analysis; food analysis; plant chemistry; physiological chemistry.

Massachusetts Agricultural College: The chemistry of plant nutrition; soil chemistry; animal physiological and pathological chemistry, including chemistry of foods and milk; insecticides and fungicides.

Massachusetts Institute of Technology: Courses in food analysis; organic chemistry; sugar analysis; special research work.

University of Minnesota: Advanced agricultural analysis.

University of Missouri: Advanced agricultural chemistry; chemistry of the proteins; physiological chemistry; research course in agricultural chemistry.

University of Nebraska: Analysis of agricultural products; chemistry of soils and fertilizers; research in soil chemistry.

Rutgers College, N. J.: Research course in agricultural chemistry.

Cornell University, N. Y.: Food analysis; advanced agricultural chemistry; agricultural analysis; dairy chemistry; biochemistry; special research course.

Columbia University, N. Y.: Physiological chemistry; chemistry of digestion and assimilation; chemistry of foods and nutrition; chemistry of animal tissue; biological chemistry; chemical physiology of plants; chemistry of microorganisms; fermentations, putrefactions, and enzyme actions in general.

Ohio State University: Advanced agricultural analysis; food inspection and analysis; dairy chemistry; soil chemistry; chemistry of animal nutrition; special research work.

Pennsylvania State College: Physiological chemistry; special research course in agricultural chemistry.

Rhode Island State College: Individual research work in agricultural chemistry.

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University of Tennessee: Advanced agricultural analysis; analysis of food materials and animal excretory products.

University of Wisconsin: Advanced biochemical analysis; analysis of foodstuffs; sugar-beet analysis; chemistry of plant nutrition; physiological chemistry; advanced dairy chemistry; soil chemistry; seminar in agricultural chemistry; research in plant chemistry.

AGRONOMY.

University of California: Advanced courses in experimentation with field crops, including crop improvement; advanced undergraduate courses in soils, irrigation, drainage, soil chemistry, and the chemistry of fertilizers.

Georgia State College of Agriculture and Mechanic Arts: Research in soils, in soil fertility and management, and in farm crops.

University of Illinois: Soil investigation; soil history; field crops; soil physics and management; soil biology; soil fertility, fertilizers, rotations; comparative agriculture; plant breeding; plant food supplies; the mechanical composition of soils.

Purdue University, Ind.: Advanced courses in soils, fertilizers, and in farm crops.

Iowa State College: Cereal breeding; general crop problems; soil physics, fertility, and management.

Massachusetts Agricultural College: Special research in soils and farm crops.

Michigan Agricultural College: Special work assigned to meet the needs of the student.

University of Minnesota: Plant breeding of cereals, grasses, roots, and field crops; advanced research in field crops.

University of Missouri: Investigation of particular problems arranged to meet the needs of the student.

University of Nebraska: Advanced field crops; advanced soils; special research course in soils and field crops.

Cornell University, N. Y.: Cereals; forage crops; advanced farm crops; soil investigation with reference to chemical, physical, and biological properties; irrigation and drainage; research courses in farm crops and soils.

Ohio State University: Advanced crop production; advanced crop improvement; research work in soils.

Pennsylvania State College: Study and research to meet the needs of the student.

Rhode Island State College: Individual research work in soils and farm crops.

University of Tennessee: Individual research work in soils and farm crops.

University of Wisconsin: Grain inspection and weed control; breeding grains and forage plants; soil management; soil chemistry; soil physics; drainage; plant nutrition; origin and classification of soils; research work in special problems.

SOILS AND FERTILIZERS.

University of California: Advanced undergraduate courses in soil physics, chemistry, and bacteriology; the chemistry of fertilizers; drainage and irrigation; design and management of irrigation systems; graduate research course in soil problems.

Georgia State College of Agriculture and Mechanic Arts: Research in soils, in soil fertility and management.

University of Illinois: Soil investigations; soil history; soil physics and management; soil fertility, fertilizers, rotation; mechanical analysis of soils; soil biology.

Purdue University, Ind.: Special research in soils; soil bacteriology.

Iowa State College: Courses in soil physics, fertility, and bacteriology; and in the management of soils.

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Massachusetts Agricultural College: Soil chemistry; advanced work on manures and fertilizers; research in soils.

University of Minnesota: Research in soil fertility.

University of Nebraska: Soil analysis; chemistry of soils and fertilizers; research in soil chemistry and physics.

Cornell University, N. Y.: Soils of the United States; soil mapping; certain phases of soil study; advanced laboratory course with reference to the chemical, physical, and biological properties; irrigation and drainage; research course in soils.

Ohio State University: Advanced soils; soil chemistry; soil bacteriology; research in soils.

Pennsylvania State College: Laboratory soils; soil investigation and studies of soil extract.

Rhode Island State College: Individual research in soils.

University of Wisconsin: Soil management; soil chemistry; soil physics; drainage design; irrigation design and management; plant nutrition with reference to the relation of the plant and soil; origin and classification of soils and agricultural climatology; research work in special problems.

BOTANY.

University of California: Advanced economic botany; plant pathology; mycology; botanical seminar and research.

Yale University, Conn.: Biochemistry of plants; diseases of trees; plant physiology.

University of Illinois: Advanced cytology and physiology; plant pathology; plant breeding.

University of Chicago, Ill.: Cytology in its bearing upon the theories of heredity and variation; plant physics; plant chemics; research in plant physiology.

Purdue University, Ind.: Research course in plant physiology and pathology.

Iowa State College: Plant physiology; plant breeding; seed testing; applied botany, with special reference to the more important food plants.

Iowa State University: Experimental plant physiology; general mycology; plant pathology.

University of Kansas: Experimental plant physiology.

Massachusetts Agricultural College: Vegetable physiology; vegetable pathology; mycology; phylogeny; history of botany; history and theory of evolution.

Harvard University, Mass.: Economic botany; bacteria, mycetozoa, and higher fungi; variation, heredity, and the principles of animal and plant breeding; plant physiology; advanced study on special topics in variation and heredity. Research courses in plant physiology and in variation, heredity, and plant breeding are given at the Bussey Institution.

Michigan Agricultural College: Courses in the study of weeds; seed testing; plant pathology and physiology.

University of Michigan: Plant physiology; mycology and plant diseases; bionomics; physiology of the reproductive organs; plant breeding; special investigation.

University of Minnesota: Plant physiology; fungi; industrial botany; problems in cytology and embryology; vegetable pathology; advanced agricultural botany; problems in physiology and ecology.

University of Missouri: Physiology of plant nutrition; diseases of plants; research courses in physiology, morphology, experimental evolution and heredity; mycology and plant pathology.

University of Nebraska: Advanced mycology; forest mycology; dendrology; plant pathology; plant physiology; plant ecology; economic botany; special investigation in systematic, morphological, physiological, and pathological problems.

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Cornell University, N. Y.: Advanced mycology; plant physiology; research in physiology; plant pathology; research in pathology; plant breeding.

Columbia University, N. Y.: Experimental plant physiology; physiology of nutrition; plant pathology.

Ohio State University: Plant physiology; mycology; research in systematic botany; research in physiology and ecology.

Pennsylvania State College: Study and research courses in plant physiology arranged to meet the needs of the student.

Rhode Island State College: Research in physiology and pathology.

University of Tennessee: Ecology; physiology; pathology.

University of Wisconsin: Mycology; plant pathology; facts and theories of heredity; plant breeding in relation to horticulture.

PLANT PHYSIOLOGY.

Yale University, Conn.: Plant physiology; biochemistry of plants; diseases of trees.

University of Illinois: Advanced course in cytology and physiology; special research and investigation.

University of Chicago, Ill.: Cytology in its bearing on the theories of heredity and variation; research in plant physiology.

Purdue University, Ind.: Research work in physiology.

Iowa State College: Research work in physiology.

Iowa State University: Experimental plant physiology.

University of Kansas: Experimental plant physiology.

Massachusetts Agricultural College: Research laboratory course.

Harvard University, Mass.: Lecture course at Cambridge and a laboratory research course at Bussey Institution.

University of Michigan: Plant physiology; physiology of the reproductive organs; mycology and plant diseases.

University of Minnesota: Lecture and laboratory courses, also a research course in problems of physiology.

University of Missouri: Physiology of plant nutrition; seminar and research in physiology.

University of Nebraska: Courses in physiology and in ecology; a research course in physiological problems.

Cornell University, N. Y.: General physiology; cell physiology; physiology of fermentation; research and seminar in general and cell physiology.

Columbia University, N. Y.: Experimental plant physiology; physiology of nutrition.

Ohio State University: Laboratory and research work in physiology.

PLANT PATHOLOGY.

University of California: Advanced undergraduate courses in plant pathology; graduate research work done wholly or in part at the Southern California Pathological Laboratory at Whittier.

University of Illinois: Diseases of plants and disease agents; parasitic fungi, diseases due to them.

Purdue University, Ind.: Research work in plant diseases.

Massachusetts Agricultural College: Research laboratory course.

University of Minnesota: Advanced pathology with research in special problems.

University of Missouri: Diseases of plants; seminar and research in pathology.

University of Nebraska: General plant pathology; research courses in mycological and pathological problems.

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Cornell University, N. Y.: General pathology; principles of plant disease control; etiology of plant diseases; diseases of field and truck crops; diseases of fruit and fruit trees; diseases of greenhouse and florists' crops; dendropathology and dendrosurgery; phytopathological technique; pathological histology; research course and seminar in pathology.

Columbia University, N. Y.: Diseases induced by cryptogamic parasites.

University of Wisconsin: Seminar in the literature and methods of research; research course in pathology.

BACTERIOLOGY.

University of California: Advanced undergraduate courses in dairy, medical, and soil bacteriology open to graduates; original study on special topics pertaining to dairy and soil bacteriology.

Yale University, Conn.: Courses in bacteriology and hygiene; bacteriology of water and sewage; advanced work and research in bacteriology and hygiene.

University of Illinois: General bacteriology; micro-organisms related to the animal body in health and disease; bacteriology of animal food products; special investigation and research work.

University of Chicago, Ill.: General and advanced bacteriology; research in bacteriology; sanitary aspects of milk supply; sanitary water supply.

Purdue University, Ind.: Courses in soil and sanitary bacteriology.

Iowa State College: Courses in general, sanitary, soil, and dairy bacteriology.

University of Kansas: General bacteriology; dairy bacteriology; water analysis.

Massachusetts Institute of Technology: Courses in dairy and water bacteriology, and in the bacteriology of fermentation industries.

Harvard University, Mass.: Elementary course in general bacteriology; research course.

Michigan Agricultural College: Dairy, fermentation, pathological (animal), plant, and soil bacteriology; courses in bacteriological studies of water and water supplies, of sewage and sewage disposal, of foods and food preservation.

University of Minnesota: General bacteriology; research work.

University of Nebraska: Courses in general, elementary, dairy, and agricultural bacteriology.

Cornell University, N. Y.: Special research course in dairy and agricultural bacteriology.

Columbia University, N. Y.: Laboratory course in advanced bacteriology; bacteriological chemistry.

Ohio State University: Courses in general, dairy, and soil bacteriology; pathogenic bacteria; water examination and sewage disposal; immunity and serum therapy; and special research work.

University of Wisconsin: Courses in medical bacteriology dealing with disease processes in man and animals; agricultural and dairy bacteriology; transmissible diseases of animals, and special advanced agricultural bacteriology.

PLANT BREEDING.

Georgia State College of Agriculture and the Mechanic Arts: The principles of heredity; cytological aspects of plant breeding with special reference to the cotton plant.

University of Illinois: Course in thremmatology covering general principles of evolution and heredity as applied to domesticated plants and animals; special courses in the departments of agronomy and horticulture, including lectures, demonstrations, laboratory and seminary exercises; special research problems.

Iowa State College: Investigation of principles and methods; course in cereal breeding.

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Massachusetts Agricultural College: Plant breeding and evolution as applied to horticulture.

Harvard University, Mass.: Research course in variation, heredity, and principles of breeding at the Bussey Institution.

University of Minnesota: Advanced research in plant breeding in cereals, grasses, roots, and field crops.

University of Missouri: Experimental evolution and heredity.

Cornell University, N. Y.: Principles and practice of breeding; biometry; research in problems of breeding, heredity, and general evolutionary topics; seminar in plant breeding.

University of Wisconsin: Laws of plant breeding and their relation to horticulture; breeding grains and forage crops; facts and theories of heredity.

HORTICULTURE.

University of California: Advanced undergraduate courses in horticulture, ampelography, and pomology; graduate courses in horticulture and viticulture.

Georgia State College of Agriculture and the Mechanic Arts: Advanced instruction in pomology and general horticulture.

University of Illinois: Courses in pomology, olericulture, spraying, orcharding, landscape gardening, evolution of horticultural plants, and landscape horticulture.

Purdue University, Ind.: Advanced course in general horticulture, and in pomology and olericulture.

Iowa State College: Courses in plant breeding, as related to horticulture; plant propagation; pomology; and special research problems.

Massachusetts Agricultural College: Pomology; olericulture; greenhouse plants and problems; floriculture; landscape gardening; plant breeding and evolution; questions of physiology connected with propagation and pruning.

Michigan Agricultural College: General horticulture and pomology.

University of Minnesota: Research and study course arranged to meet the needs of the student.

University of Missouri: Pomology; forest economy; olericulture; ornamental plants; research work.

University of Nebraska: Plant breeding; genetics with reference to variation and heredity; research in horticultural problems.

Cornell University, N. Y.: Floriculture; olericulture; pomology; nuciculture; subtropical pomology; literature of horticulture and landscape gardening; evolution of plants; plant breeding; research and seminar in special horticultural problems.

Pennsylvania State College: Study and research course arranged to meet the needs of the student.

University of Wisconsin: Plant breeding as related to horticulture; experimental horticulture; pomology; olericulture.

FORESTRY.

Yale University, Conn.: A two-year graduate course leading to the degree of master of forestry.

Iowa State College: Courses in forest botany, mensuration, economics, wood-technology, and silviculture are offered for minor work only.

Harvard University, Mass.: A two-year graduate course leading to the degree of master of forestry.

University of Michigan: A two-year graduate course leading to the degree of master of science in forestry and a five-year collegiate and graduate course leading to the same degree.

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University of Minnesota: One-year course leading to the degree of master of science and a three-year course leading to the degree of doctor of science.

University of Nebraska: Offers a five-year course, collegiate and graduate, leading to the degree of master of forestry.

University of Washington: Two-year graduate course leading to degree of master of forestry and a five-year collegiate and graduate course leading to the same degree.

AGRICULTURAL ENGINEERING, DRAINAGE, AND IRRIGATION.

University of California: Advanced undergraduate courses in irrigation institutions and economics, irrigation engineering, irrigation design, water supply, drainage, agricultural hydraulics, irrigation drawing; graduate courses in drainage and in the design, management, and operation of irrigation systems.

Iowa State College: Courses in farm architecture, road construction, investigation of farm implements, farm motors, drainage and irrigation; research course in drainage and irrigation.

Massachusetts Institute of Technology: Water power and irrigation.

University of Minnesota: Drainage.

Cornell University, N. Y.: Irrigation and drainage.

University of Wisconsin: Drainage and irrigation designs.

LANDSCAPE GARDENING.

University of Illinois: Landscape gardening and landscape horticulture.

Massachusetts Agricultural College: Landscape gardening.

Harvard University, Mass.: Two-year course in designs, construction, and horticulture, leading to the degree of master of landscape architecture.

University of Michigan: One-year course in landscape designs and gardening, leading to the degree of master of landscape design.

Cornell University, N. Y.: A four-year collegiate course is offered in rural art, including landscape designing and gardening. The work of the last two years is open to graduate students. Advanced courses are also offered.

ZOOLOGY.

University of California: Advanced undergraduate courses in comparative anatomy, cytology, embryology, parasitology, heredity, variation and evolution, and in developmental mechanics; graduate research, seminar, and teachers' course.

Yale University, Conn.: Experimental zoology relating to embryology and regeneration; research in experimental zoology.

University of Illinois: Parasitology; problems in experimental embryology, regeneration, variation, and heredity; variation and heredity with reference to the principles of animal breeding.

University of Chicago, Ill.: Organic evolution; bionomic problems; physiology of development; physiology of form regulations; research in zoological problems to meet the needs of the student.

Massachusetts Agricultural College: Courses in advanced general, systematic, and economic zoology.

Harvard University, Mass.: Cytology with special reference to heredity; embryology; experimental morphology; variation heredity and the principles of animal breeding.

University of Minnesota: Parasitology; the animal parasites of man; cytology and histogenesis; economic zoology; embryology; special research work in zoology.

University of Missouri: Experimental zoology with special reference to the physiological aspect; experimental evolution and heredity; special research in the unsolved problems of zoology.

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University of Nebraska: Advanced animal morphology; economic zoology; animal parasites; experimental zoology on assigned problems; special research course in zoology.

Cornell University, N. Y.: Systematic zoology and ecology; advanced ecology and economic zoology; general limnology.

Columbia University, N. Y.: Experimental zoology and embryology; research course.

Ohio State University: Embryology; invertebrate zoology; research work in zoology.

University of Wisconsin: Variation and heredity; evolution problems; limnology; embryology; animal parasites; research course.

ENTOMOLOGY.

University of California: Courses in general, systematic, veterinary, medical, and economic entomology, and in parasitology, open to advanced undergraduates and graduates; special research courses in all the above open to graduates.

University of Illinois: Undergraduate courses in systematic and economic entomology are open to graduates. A course in faunistic entomology and a research course are open to graduates only.

University of Kansas: Undergraduate courses in general, systematic, and applied entomology open to graduates; graduate courses in morphology and ecology; research courses.

Massachusetts Agricultural College: Courses in general, systematic, and economic entomology are open to advanced undergraduates and graduates. Courses in morphology, ecology, advanced systematic and advanced economic entomology, and in research work are open to graduates only.

Harvard University, Mass.: Lecture and laboratory courses in general, systematic, forest, and practical entomology are given in the graduate school of applied science. A research course in economic entomology is given in the Bussey Institution.

University of Minnesota: Undergraduate courses in elementary, general, economic, and forest entomology are open to graduates; a course in special problems open to graduates only.

University of Nebraska: Courses in systematic and economic entomology are open to undergraduates and graduates. A one-year research course is given in both systematic and economic entomology.

Cornell University, N. Y.: Courses in morphology, embryology, systematic and economic entomology are open to advanced undergraduates and to graduates; research work open to graduates. Two graduate courses in limnology are offered by the entomological department.

Ohio State University: Courses in general, systematic, and economic entomology are open to advanced undergraduates and to graduates; a research course and seminar are open to graduates.

ANIMAL HUSBANDRY.

University of California: Advanced undergraduate courses in live-stock feeding, principles of breeding, and in conformation and soundness.

Georgia State College of Agriculture and the Mechanic Arts: Special courses in animal nutrition and animal breeding to meet the needs of the student.

University of Illinois: Live-stock experimentation; animal breeding; animal nutrition; investigations upon micro-organisms related to the animal body in health and disease, including a study of the bacteriology of the digestive tract, bovine tuberculosis, and infectious abortion of cattle; bacteriology of animal food products.

Purdue University, Ind.: Research course arranged to meet the needs of the student.

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Iowa State College: Animal breeding; study of breeds; stock judging; management of stock; animal nutrition; research courses in poultry husbandry, breeding, feeding, housing, incubation, brooding, and rearing; and in poultry diseases and pests.

Massachusetts Agricultural College: Special research in animal husbandry.

Harvard University, Mass.: Special research in animal heredity at the Bussey Institution; a course in variation, heredity, and the principles of animal breeding in the school of applied science.

Michigan Agricultural College: Special work arranged to meet the needs of the student.

University of Minnesota: Animal feeding and nutrition; meats—structure, composition, and preparation for use.

University of Missouri: Experimental feeding; research in special phases of animal production; animal breeding; zoometry; research in stock-farm management; course in the contagious, infectious, and parasitic diseases of farm animals.

Cornell University, N. Y.: Principles of animal breeding; principles of feeding; courses in poultry nutrition investigation; poultry breeding; disease investigation; incubation and feeding investigation; incubation experiments.

Ohio State University: Breeds, history and development; animal nutrition; heredity in its application to the horse; live-stock registration, markets, and judging.

Pennsylvania State College: Study and research courses arranged to meet the needs of the student.

University of Wisconsin: Advanced live-stock judging; science and art of breeding; live-stock feeding; live-stock history; live-stock problems; research in advanced poultry problems.

PHYSIOLOGY AND PHYSIOLOGICAL CHEMISTRY.

University of California: Undergraduate courses in advanced physiology; graduate research work in physiology and physiological chemistry.

Yale University, Conn.: Physiology; physiological chemistry; physiology of nutrition; research in physiology and physiological chemistry.

University of Illinois: Research work along special lines to meet the needs of the student.

University of Chicago, Ill.: Physiological chemistry; methods of quantitative analysis in physiological chemistry as applied to plant and animal tissue; research courses in physiology and physiological chemistry.

Iowa State College: Research in human physiology and nutrition.

University of Kansas: Advanced experimental physiology; research in physiology; food analysis; chemistry of digestion; physiological chemistry.

Harvard University, Mass.: Research in physiology; general and advanced biological chemistry.

University of Missouri: Advanced physiology and physiological chemistry; research course to meet the needs of the student.

University of Nebraska: Human physiology; advanced physiology.

Cornell University, N. Y.: Advanced physiology; biochemistry.

Columbia University, N. Y.: General physiological chemistry; chemistry of digestion and assimilation; chemistry of animal tissue in health and disease; chemistry of nutrition in health and disease; advanced laboratory courses in physiology and in physiological chemistry.

Ohio State University: Laboratory and research in advanced physiology.

University of Wisconsin: Lecture course and advanced laboratory course in physiology; lecture and laboratory course in physiological chemistry.

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ANIMAL NUTRITION.

University of California: Advanced undergraduate courses in nutrition, feeds and feeding, and food chemistry, open to graduates; special research in animal nutrition for graduates only; research in physiological chemistry.

Yale University, Conn.: Courses in physiological chemistry and in the physiology of nutrition.

Georgia State College of Agriculture and the Mechanic Arts: Special courses in animal nutrition to meet the needs of the student.

University of Illinois: Courses in the principles of animal nutrition; in the chemical and physiological changes involved in animal life; in the examination and analysis of feeding stuffs and animal substances; and in advanced physiological chemistry.

University of Chicago, Ill.: Courses in physiological chemistry.

Iowa State College: Research in animal nutrition.

Massachusetts Agricultural College: Chemistry of foods; animal physiological and pathological chemistry.

University of Minnesota: Courses in animal feeding and nutrition; and in animal nutrition with special reference to the relation of feed nutrients to animal growth, animal products, and the composition of the animal.

Columbia University, N. Y.: Chemistry of digestion and assimilation; chemistry of animal tissue in health and disease; chemistry of animal nutrition in health and disease; chemistry of foods and nutrition; seminar and research courses.

Ohio State University: Chemistry of animal nutrition; principles of animal nutrition.

Pennsylvania State College: Physiology of nutrition; special topics in animal nutrition. Facilities for advanced study are given in the Institute of Animal Nutrition, a research institution affiliated with the School of Agriculture and Experiment Station.

University of Tennessee: The study and analysis of food materials; of dietary methods; the determination of the coefficients of digestibility of food materials; the determination of the heats of combustion of food materials and excretory products.

University of Wisconsin: A chemical course in the composition and digestibility of foods; physiological chemistry.

DAIRYING.

University of California: Advanced undergraduate courses in dairy chemistry, dairy manufactures, market milk, creamery management, special dairy products, and research work.

University of Illinois: Courses in economic milk production, factory management, methods of handling and preparing milk for consumption; and research course in dairy herds and in dairy feeding problems.

University of Chicago, Ill.: Course in sanitary aspect of milk supply.

Purdue University, Ind.: Courses in dairy industry and dairy chemistry.

Iowa State College: Butter making; creamery management; cheese making; testing dairy products and milk inspection; advanced dairy bacteriology.

Michigan Agricultural College: Special work assigned each student; dairy bacteriology.

University of Missouri: Advanced work to suit the needs of the student in milk production, butter making, cheese making, and pasteurization.

Cornell University, N. Y.: Dairy bacteriology; advanced milk testing; business methods as applied to the dairy industry; butter making; cheese making; dairy chemistry; dairy mechanics; research in dairy problems.

University of Wisconsin: Milk inspection and testing; butter yield and quality; cheese making and curing; advanced dairy chemistry; dairy bacteriology.

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UNITED STATES BUREAU OF EDUCATION
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AGENCIES FOR THE IMPROVEMENT OF TEACHERS IN SERVICE

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1911

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CONTENTS.

	Page.
Letter of transmittal	5
Official teachers' gatherings	7
Provisions of the law in Connecticut	8
Massachusetts	8
New Hampshire	9
Rhode Island	9
Vermont	9
Teachers' institutes	10
Their beginning	10
Present status	11
Illustrative programs, Michigan	18
Indiana	19
West Virginia	20
Illinois	24
Massachusetts	25
By whom attended	26
Function and probable destiny	27
Statistical table of teachers' institutes, meetings, and summer normals	34
Summer schools	42
Summer normal schools	42
Summer sessions in State normal schools	49
Summer schools in colleges and universities	50
Extension teaching	53
Correspondence study	58
In colleges and universities	59
In normal schools	63
Private correspondence schools	64
Local teachers' meetings	65
Functions of teachers' meetings	65
Frequency and length	68
Legal status of rural teachers' meetings	68
Teachers' meetings in cities	77
Teachers' meetings at Decatur, Ill	80
Visiting days	82
County superintendents' conferences	84
Teachers' associations	86
Teachers' reading circles	92
Books used in reading circles	101
Function of reading circles	108
Pupils' reading circles	109
Printed aids	109
Certification of teachers	111
Sabbatical years	113
Special funds for improvement of teachers	114
The merit system of promotion	116

Digitized by Google

Page.
Promotional examinations in Baltimore 117
Boston 120
Chicago 123
Cincinnati 124
Kansas City 125
Lincoln, Nebr 126
New York City 127
Paterson, N. J 129
Saginaw, Mich 130
Springfield, Ohio 133
Washington, D. C 134
General discussion 135
Classroom efficiency and success grades 137
Measuring teachers' efficiency, Decatur, Ill 139
Kansas City, Mo 142
Lincoln, Nebr 143
Saginaw, Mich 144
Washington, D. C 144
Indiana law and teachers' grading 146
Maryland law 147
Participation of teachers in the determination of educational policies 151
INDEX 155

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, June 28, 1911.

SIR: Agencies for the improvement of teachers in service are needed primarily for three reasons: (1) Because many teachers enter the profession relatively untrained and therefore need to be trained in service, if at all; (2) because complete training is impossible before active service begins, for the reason that the necessary basis for it in experience is not at hand; and (3) because teaching is a progressive calling, in which one who does not continually make efforts to go forward will soon lag behind and become relatively inefficient.

The public is deeply interested in such provisions as will keep the teaching force of the public schools keyed up to its highest efficiency.

With these considerations in view, I have the honor to present herewith a monograph by Prof. Ruediger on *Agencies for the improvement of teachers in service*, and to recommend that it be published as one of the numbers for the current year of the bulletin of the Bureau of Education.

Very respectfully, ELMER ELLSWORTH BROWN,
Commissioner.

The SECRETARY OF THE INTERIOR.

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AGENCIES FOR THE IMPROVEMENT OF TEACHERS IN SERVICE.

[Abbreviations used in the text: A. R. = Annual Report. S. L. = School Laws. S. R. = State Superintendent's Report. N. E. A. = Proceedings, National Education Association.]

OFFICIAL TEACHERS' GATHERINGS.

In discussing agencies for the improvement of teachers in service, one's mind naturally turns first to those periodical meetings of teachers, such as institutes, that are established by law. The data pertaining to meetings of this nature that have been collected are summarized in Table I. These were gathered primarily from State and Territorial school laws, but this source was liberally supplemented by State educational reports, by institute and summer-school bulletins, and by correspondence with State school officers.

This monograph is intended to present what is actually being done, and not merely to give an outline of the legal provisions.

The word "institute" has not a very definite meaning in educational literature. It is a blanket word that is applied indiscriminately to any officially established gathering of teachers. Because of this fact, these gatherings have been divided, so far as possible, into classes according to their nature, regardless of the names used in the laws to designate them. On this basis three classes have been made, as follows: (1) Teachers' institutes; (2) summer normal or summer training schools; and (3) teachers' meetings.

Perhaps a fourth class—teachers' associations—should have been added, but the legally established gathering in only one State—Maine—approaches the nature of the customary teachers' association. The word "association" is used also in the laws of Kentucky and Missouri, but the meetings to which it is applied are classified more logically under one of the other heads.

The criteria that distinguish institutes, summer normal schools, teachers' meetings, and teachers' associations will be brought out more and more as this discussion proceeds. But for the present it may be said that one essential characteristic of a teachers' association is that it is voluntary and that the other three classes of gatherings may usually be distinguished by the functions they are trying to perform.

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The essential function of the summer normal school is the training, or the further training, both academic and professional, of teachers; the three essential functions of the teachers' meeting are (1) to coordinate the educational forces in any given administrative or supervisory unit; (2) to assist the teachers in their work and to improve their teaching at specific points; and (3) to keep the teachers abreast in educational thought and practice; while the old time institute may be described as a meeting that tries to discharge the conglomerate functions of all the other meetings, including even the association.

The time element might be used to distinguish teachers' meetings, institutes, and summer normal schools, but this is a secondary characteristic. A teachers' meeting usually continues in session 1 day, or perhaps 2; an institute from 3 to 10 days; and a summer normal from 3 to 8 weeks.

As might have been expected, a number of these gatherings scheduled in Table I are not readily classified according to the criteria here presented. Whenever a gathering might have been classified in more than one way, a question mark has been placed after the word indicating the nature of the gathering in the third column of the table. Twelve of these question marks appear. Most of them will be explained in their proper connections later, but those pertaining to the short institutes in Connecticut, Massachusetts, New Hampshire, Rhode Island, and Vermont may be briefly considered at this point.

CONNECTICUT.

The Connecticut law provides merely that the State board of education shall hold—

> at convenient places in the State, meetings of teachers and school officers, for the purpose of instructing in the best modes of administering, governing, and teaching public schools, and by such other means as they shall deem appropriate; but the expenses incurred in such meetings shall not exceed the sum of $3,000 in any one year. (S. L., 1910, p. 7.)

Under this law 94 meetings were held in 1905–6, 131 in 1906–7, and 113 in 1907–8. Only 7 of these meetings continued in session two days, the sessions of all the others being one day. (S. R., 1909, p. 189.)

MASSACHUSETTS.

The Massachusetts law provides that "if twenty-five teachers of public schools in at least three contiguous towns desire to form a teachers' institute, the board of education shall * * * appoint a time and place for such meeting and make suitable arrangements therefor." (S. L., 1909, p. 11.)

Under this law one 2-day meeting and fifteen 1-day meetings were held in 1909 at a total cost to the State of $1,658.14. From 3 to 150 towns were represented at each meeting and the total attendance was 2,507. (S. R., 1908–9, p. 96.)

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NEW HAMPSHIRE.

The New Hampshire law provides that the superintendent of public instruction "shall organize, superintend, and hold at least one teachers' institute each year in each county of the State, and appoint the time and place, and make suitable arrangements therefor." (S. L., 1909, p. 49.)

In administering this law the superintendent is allowed much freedom. In the year 1907–8 he expended the institute fund for five different purposes, and held in all 40 meetings. He (1) held twenty-five 1-day institutes for common schools; (2) paid the expenses of 1 sectional teachers' association held in connection with an institute; (3) donated the money formerly used for a two weeks' summer institute to the summer session at the State normal school, and held a supervisors' meeting at that school; (4) held 2 county superintendents' institutes, at which he paid the expenses of attending superintendents; and (5) held 13 school-board meetings or institutes. To this list he has now added institutes for high-school teachers. The total cost to the State of these meetings held in 1907–8 was $2,304.15.

RHODE ISLAND.

Rhode Island annually places at the disposal of the State commissioner of public schools an appropriation of $500 to be expended for teachers' institutes. This money is given in part to the meetings of the State teachers' association, known as the "Rhode Island Institute of Instruction," which are held for three days, usually in the latter part of October, and in part to institutes and meetings held in the different towns by the State commissioner or by the town authorities. The holding of these meetings is not compulsory, and the town authorities and the State commissioner generally cooperate in conducting them. In 1909–10 three institutes and six teachers' meetings ranging in length from one to three days were held.

VERMONT.

The Vermont law provides that the superintendent of education—

> shall hold at least one and not more than two teachers' institutes in each county during each biennial term. In an institute special attention shall be given to the training of teachers in the methods of instruction. * * * An institute shall not continue more than four days. (S. L., 1907, sec. 915.)

Under this law—

> in addition to regular evening sessions, meetings of teachers have been held during the day in which matters pertaining to school methods and discipline have been discussed. Various other meetings have been held either during the day or evening, and the nature of such has usually depended upon the immediate need of the locality. (S. R., 1908, p. 48.)

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TEACHERS' INSTITUTES.

THEIR BEGINNING.

The history of teachers' institutes very nearly parallels that of normal schools. Both took their rise in the United States near the beginning of the forties of the nineteenth century.

The first institute held on American—and probably any other—soil is credited to the initiative of Henry Barnard. In October, 1839, Mr. Barnard, then secretary of the State board of education in Connecticut, assembled at Hartford 26 young men and formed them into a class. "They were taught for six weeks by able lecturers and teachers and had the advantage of observation in the public schools of Hartford. In the spring of 1840 a similar arrangement was made for women teachers; but for a number of years there were no further meetings of this kind" in Connecticut.

"In 1846 a convention of teachers was held at which more than 250 assembled. The exercises consisted of instruction and discussions and continued through five days.

"In 1847 16 meetings were held in different parts of the State, and more than 1,200 teachers were gathered and instructed in the best methods of governing and organizing schools."[1]

In 1848 Supt. Seth P. Beers, in his report to the assembly, estimated that three-fourths of the teachers in Connecticut were reached by these meetings, usually continuing for five days, which were to all intents and purposes teachers' institutes.

But the name "institute" was not applied to these teachers' or normal classes initiated by Henry Barnard. This name was apparently first used in 1843 by J. S. Denman, superintendent of schools of Tompkins County, N. Y. Supt. Denman in that year conducted a two-weeks institute for the teachers of his county.

After the year 1843 the practice of holding teachers' institutes began to spread rapidly throughout the northern States. For this statement we have the authority of Horace Mann, who, in his annual report for 1844–45, pages 43–44, says: "They originated in the State of New York in 1843, and they have so commended themselves to the friends of education that they have been held during the current season in more than half of the counties of the State of New York, and in the States of Ohio, Pennsylvania, New Hampshire, Rhode Island, and Massachusetts." The class organized by Henry Barnard, to which he refers in a footnote, Horace Mann evidently did not regard as the beginning of teachers' institutes, preferring to take as the starting point the time when the name was actually used.

The rise and success of teachers' institutes in Massachusetts, which typifies their rise in many other States, is clearly indicated by Horace

[1] Smart: Teachers' Institutes (Circular of information of the Bureau of Education, No. 2, 1885).

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Mann in his reports for the years 1843–44, 1844–45, and thereafter. In the report for 1843–44, pages 69–74, he pleads eloquently for the adoption by Massachusetts of the New York system of institutes, and in his next report he gives a lengthy account of the first institutes held in Massachusetts. Money for the purpose was obtained from the Hon. Edmund Dwight, who placed $1,000 at Mann's disposal. Four institutes, each of two weeks' duration, were held in different parts of the State. Able and noted educators donated their services and the money was used for incidental expenses and for compensating the teachers for attending. The attendance at each institute was restricted to 100 teachers, 50 male and 50 female, and each was paid $2 for attending the full two weeks, a shrewd way of starting in with a well attended institute, an element so essential to its success.

The success of these institutes induced the legislature to make provision for them for succeeding years. It was provided that six institutes should be held annually where they were most demanded by the teachers, and the expenses of each were limited to $200. This, Horace Mann says, was not always sufficient, and adds, "although I always gave my services gratuitously, I paid the balance out of my own pocket." The practice of paying the teachers for attending was discontinued and the instructors were paid a salary.

This, in outline, is the history of the beginning of teachers' institutes. For an interesting account of their development in other States the reader is referred to Smart, *opere citato*, pages 34–59.

PRESENT STATUS.

It is evident from Table I that the typical teachers' institute occurs once a year, is bounded by county lines, and continues in session five days.

Omitting from the present discussion the short institute meetings that have been discussed above, the rule of holding one county institute a year finds exception only in North Carolina, where institutes are held biennially. In Nevada, which is divided into five institute districts, institutes are held in each district only in odd years, but a State institute is held in even years, thus giving the State at least one institute a year. But exceptions to the once-a-year rule may legally occur also in North Dakota, South Dakota, West Virginia, and Wisconsin. It is seldom, however, that the privilege of holding more than one a year is exercised.

It should be said in passing that the institutes noted in the table refer only to white teachers. All through the South the laws provide that separate institutes must be held for white and for colored teachers, and this nearly duplicates their number in that part of the country. In Delaware the law provides for an annual institute for colored teachers in Kent County. In Missouri the State board of educa-

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tion is authorized to organize ten or more institutes for negroes; these institutes continue in session two weeks and the grades made in them are to be accepted by the county superintendent in lieu of examinations for certificates in the subjects covered; a tuition fee of $2 is charged, which is all the support the institute receives.

The county is the territorial unit for institutes in all the States where they are held except Colorado, Nevada, and New York.

In New York they are held in the school commissioners' districts, which are nearly coextensive with the counties. Colorado and Nevada are each divided into 5 institute districts.

The Nevada law provides that one institute shall be held in each district in odd years, but according to the State superintendent's report for 1909 this number is for various reasons not always realized. In this State county institutes are also held occasionally.

In about one-half the States the laws provide that counties may join in holding institutes. Apparently this is not often done, but it is not unknown and is common in a few of the western States. In Idaho, for example, a large joint institute of the southern counties is held annually at Lewiston.

State institutes have long been held in Michigan and Nevada, and another one of this type was inaugurated in the spring of 1910 in Nebraska. It may be questioned, however, whether "institute" is the proper term to apply to these meetings. "Educational conference" would perhaps be more appropriate. This is certainly true of the meeting that was held in the spring of 1910 at Lincoln, Nebr. This meeting consisted primarily of a series of sectional conferences for county superintendents, for junior normal instructors, for normal-school teachers, for institute instructors, for college and university teachers, for school officers, for teachers of agriculture, for officers of the State and district teachers' associations, etc. There was also an interstate conference for State superintendents on certification. The problems confronting the rank and file of the teachers received but scant attention.

The State superintendent of Michigan usually announces a teachers' institute for the State of Michigan for the times and places at which the State or sectional teachers' associations meet. As these associations usually meet for three days, the institutes also continue in session that long. One would think that during an association meeting the time of teachers would be sufficiently occupied without an institute, but the primary purpose of announcing an institute appears to be to secure a larger attendance, for during institutes the school boards are authorized by law to close their schools, and the teachers are entitled to their time and compensation if they attend. The general programs and sectional meetings usually found at association meetings are carried out.

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The length of institutes is not always definitely prescribed by law, and in more than half the States some leeway is given to the authorities. In approximately one-fourth of the States the maximum and minimum lengths are set, in another fourth only the maximum length is set, in another fourth one definite length is set, and in the remaining fourth the whole matter of length is left with the authorities.

The time when institutes are held is usually left to the discretion of the State or local authorities. It is approximately indicated only in the States of Alabama, Arkansas, Georgia, Nebraska, Kentucky, South Dakota, West Virginia, and Texas. Institutes appear to be held in all months of the year, although most of them are held during the summer and fall months. For details, see column 7 of Table I.

Attendance upon teachers' institutes is compulsory in 28 States. In the others it is optional, but inducements are frequently offered by the payment of the regular salary, by per diem compensation, or by adding a certain percentage to the average standing made in the examination for certificates. In Indiana, where 2 per cent is added, this addition to the standing amounts indirectly to money compensation, for the teacher's salary depends in part on the standings made in the examination.

The regular salary of the teacher is, or may be, allowed during institute attendance in term time in 29 States, in 8 of which attendance is not compulsory. In a number of States other inducements are added to the regular salary. Arizona gives a mileage allowance of 10 cents, while Arkansas, Oklahoma, and Texas renew or extend the license. Two States, Iowa and Mississippi, apparently give no direct form of compensation whatever, while New Mexico pays only those teachers that hold third-grade certificates. These receive $15 for four weeks of attendance.

Seven or eight States have legal provisions for paying their teachers for institute attendance during other than term time. South Dakota, which allows the regular salary for attendance upon the county institute in term time, provides for a $2 per diem compensation and 5 cents mileage within the district for attendance upon the district teachers' meetings which are held on Saturday. The 2 per cent added to the average standing by Indiana, and the 5 per cent added by Colorado, operate, of course, for attendance at all times of the year, and the same may be said of the $1.50 per diem allowed by West Virginia. Ohio allows the regular salary during term time and $2 a day for an attendance of not less than four nor more than six days in vacation if the teacher begins teaching within three months after attending. The burden of payment falls on the district in which the teacher will teach. Pennsylvania pays the teachers $3 a day, but not the regular teaching salary. In New York the regular salary may be allowed in vacation if it is so specified in the

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contract, while in Washington, where the aim is to hold the institutes just before the schools open, the regular salary is always allowed. In Texas "a teacher who, prior to the date of the institute, has been employed to teach in the county is entitled to pay for attending the institute, whether the school has begun or not." (S. L., p. 20, note.) The Minnesota law provides that the teacher be allowed to make up the time lost from school because of institute attendance.

But additions to the average examination grades, extension of license, and salary, per diem, and mileage allowances are not the only means used in getting teachers to attend institutes. In 20 States compulsory attendance is reenforced by a penalty of some sort. In 16 States the penalty consists of debarring the nonattendant from teaching, usually until another institute has been attended, unless an acceptable excuse is forthcoming; in 3 States, Louisiana, New Jersey, and South Dakota, salary varying from two days to a month is forfeited, and in Pennsylvania the amount that would have been received for attending the institute is deducted from the regular salary, making a loss of $6 a day for nonattendance. In Georgia, a reasonable fine, the amount of which is not specified in the law, may be imposed. In Oregon, besides the revocation of the license, the grade of the certificate held by the teacher may be reduced, while in Washington the salary may apparently be forfeited even if school is kept during the institute session. In 6 States, Arizona, California, Delaware, Maryland, Missouri, and Wyoming, the law states that the teachers shall, must, or are required to attend institutes, but no penalty is specified for nonattendance. These States are, however, among the number in which the regular salary is allowed for attendance in term time.

The means for the support of teachers' institutes are derived from three sources, from the State, from the county, and from the teachers in the form of examination, license, and registration fees. In 8 States institutes are supported entirely by the State, in 5 entirely by the counties, and in 7 or 8 entirely by fees. This comprises approximately one-half the States scheduled in the table. In the other half some combination of these three methods of support is used. The teachers themselves support institutes either in whole or in part in 28 States, but in 3 or 4 of these States this support is voluntary.

The justice of requiring fees from teachers for the support of institutes depends upon the function that one assumes the institute to possess. If it is a teachers' training school—a temporary normal school, as it is designated in the Maryland law—then fees are as legitimate as in any other teachers' training school. Again, if the institute partakes of the nature, in part at least, of a voluntary county teachers' association in which the teachers themselves take all or a part of the

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initiative, then also some fees, at least, are in place. But if the institute is essentially a county teachers' meeting, held by the officials for the immediate benefit of the schools, then the teachers should no more be asked to support it than to support the schools. As, however, institutes are aiming to discharge all three of these functions, we may expect variety in the means of support.

Of the 47 meetings that are labeled "institute" in the table, approximately one-half are organized by the local authorities, usually the county superintendent; one-fourth by the State authorities, usually the State superintendent or corresponding officer; and one-fourth by the concurrent action of the local and State authorities. When more authorities than one participate in the organization, the one mentioned first in the table takes the leading part. This observation applies also to columns 13 and 14.

In Maine, Massachusetts, and Ohio, the initiative in holding institutes or associations rests with the teachers themselves and the institutes are organized by committees selected by the teachers. The Ohio law provides further that, if the teachers fail to hold an institute for two years in succession, the State commissioner of common schools may hold one.

A glance at the column in the table under the head "Work assigned by—" indicates that the work followed at teachers' institutes is assigned by the State and by the local authorities with nearly equal frequency. Out of 47 institutes, the work of 16 is assigned by the local authorities, that of 22 by the State authorities, and that of 9 by the local and State authorities combined.

The methods of securing instruction for teachers' institutes again indicate that in approximately one half the States the institutes are State-controlled and that in the other half they are locally controlled. The table gives the data for 46 institutes held in 42 different States. In 16 of these institutes the instructors are appointed by local authorities, in 16 by State authorities, and in 14 by State and local authorities combined.

When the State takes the leading part in securing instruction for institutes, it either appoints the instructors outright or limits the selections by the local authorities to a list prepared by the State or to persons licensed by it. In South Dakota the State superintendent prepares a list from which the county superintendents must choose, while in Colorado, Kansas, New Mexico, Oklahoma, and Wisconsin, the instructors must have a special license granted by State authority.

In Kentucky and North Carolina annual conferences of State institute conductors are held by the State superintendents. At the North Carolina conference, which lasts four days, an institute program is prepared that is progressive through a number of years. Attendance at the conference is required of institute conductors.

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In Michigan and Nebraska the State institutes operate in part as conductors' conferences, and in Mississippi the reading circle exists primarily for the preparation of institute conductors.

Instruction at institutes is secured from many sources. State and county superintendents have the closest official connection with institutes and one or both of these officials is practically always present to give instruction. Specially appointed conductors and instructors are probably more frequently secured from the faculties of normal schools than from any other one class of teachers. One member of the faculty in each normal school in Wisconsin is designated "Institute conductor," and it is his duty to conduct institutes without extra salary whenever called upon. Other members of the faculty are, however, also expected to render institute service. The Maryland law provides that each institute must be attended "by one or more instructors of the State normal school or normal department faculty, to be selected by the State superintendent and the principal of the school." (S. L., 1910, p. 39.) In New Hampshire "the principal and teachers of the State normal school shall assist and give instruction at teachers' institutes". (S. L., 1909, p. 51.) The laws of several other States, among them Utah, suggest that the normal schools be called upon to furnish instructors for institutes. But college and university teachers, city superintendents, principals, high-school teachers, and others are also continually called upon to render service at institutes.

A departure from the usual lines in managing institutes is found in Louisiana and North Carolina. In each of these States teachers' institutes are in general charge of one person especially appointed for that purpose. The Louisiana law provides that the State board of institute managers "in their discretion shall select an experienced institute conductor who shall have general charge of the summer normal work." (S. L., 1908, p. 61.) This position was created in 1888 and is now filled by Mr. L. J. Alleman. Mr. Alleman, however, does not conduct many institutes himself. He was present in this capacity at only one institute between September, 1907, and February, 1908. (S. R., 1906–7, pp. 24–25.)

The duties of the officer are briefly described by Mr. Alleman as follows:

1. To prepare programs and courses for all teachers' institutes and summer schools of the State.
2. To have general supervisory control of summer schools and institutes.
3. To make reports to the State superintendent on the progress of the institute work in the State.
4. To visit, for the purpose of inspection, institutes and summer schools.
5. At all times when not engaged in institute work, to assist the State superintendent.

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North Carolina has a supervisor of teacher training. This position was created in 1909, and its duties are outlined as follows by Mr. J. A. Bivins, the first and present incumbent of the position:

1. To outline and systematize the work of the county institutes. To meet with institute workers in a four days' conference each year before the institutes open, for the purpose of discussing every phase of the work.

2. To have in charge the teachers' reading circle and all that pertains to it.

3. To supervise the county teachers' associations, planning programs for the same, keeping the work of the associations correlated with the institutes and the reading circle. To receive reports from these associations monthly, and to keep in touch with them through correspondence and visitation.

4. To supervise the preparation of bulletins that have to do with the professional work of the teacher.

Maryland had a State institute director from 1898 to 1900, but the duties of this position have since been discharged by the State superintendent.

New York manages her institutes through the third assistant commissioner of education. The State employs five institute conductors, paying them each $3,000 a year and expenses; two special instructors in drawing, at $2,500 and $2,200 a year; an instructor in English, at $2,000 a year; and an instructor in primary work at $1,200 a year. During the busy season assistants are engaged from among the better-qualified teachers of the State at $10 a day and expenses.

Nebraska distinguishes between instructors and entertainers, and persons of both kinds are engaged for institutes.

The nature of the work offered in teachers' institutes varies widely. This variation is due not merely to the difference in the men who conduct the work, although this is no doubt a large factor, but also to the difference in the needs of the communities in which the institutes are held and to the various purposes that the controlling authorities conceive the institutes to possess.

The work of institutes can be judged to a certain extent by the published programs and especially by the manuals issued by the educational departments in a number of the States. These manuals contain not only programs, but also detailed outlines of the work and suggestions for the instructors and the teachers.

In general, the following types of exercises are found in all teachers' institutes: Classes for the study and the review of subject matter (less now than formerly); lessons on devices, method, applied psychology, and management; and inspirational lectures intended to give enthusiasm for teaching and enlarged perspective. One evening during the institute is usually given to a program of a musical and literary nature, together with an address on some general educational topic, and to social recreation.

A few illustrative programs selected from the States of Michigan, Indiana, West Virginia, Illinois, and Massachusetts are reproduced

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in the following pages. These States have been selected not because institutes are especially typical in them, but because specimen programs from them were given by Smart in his study on teachers' institutes published by the Bureau of Education in 1885. Anyone interested in the changes or lack of changes that have come about since that time may readily make comparisons.

The quotations given by Smart are long, consisting of entire manuals or programs for an entire institute session, but brief extracts only are here given. Indeed, with the exception of West Virginia, these States have abandoned the custom of issuing lengthy instructions and outlines for institutes. This curtailment may be indicative of a trend away from institutes, but it would not be safe to draw such a conclusion from this source alone.

MICHIGAN.

Program for annual all-county inspiration institute for Saginaw County teachers and patrons, February 24 and 25, 1910.

Lecturers: Miss Lida B. Earhart, New York City, and Mr. Preston W. Search, Wyoming (Cincinnati), Ohio.

Conductor: Dr. C. O. Hoyt, Ypsilanti.

Burton S. Tefft, commissioner of schools.

Thursday Evening, February 24.

7.45	Music	East Side High School.
8.00	Address: Thomas Jefferson and aiding in democracy	Dr. C. O. Hoyt.
9.15	Song: America	Association.

Friday Morning, February 25.

8.40	Music	Pupils of John Moore School.
8.55	Invocation	Rev. W. H. Rider.
9.00	How to study	Miss Lida B. Earhart.
9.40	The teaching process	Dr. C. O. Hoyt.
10.20	Intermission.	
10.30	Song	Master George Gramlich, Bridgeport.
10.45	Lecture: Face to face with great ideals	Mr. Preston W. Search.
12.00	Noon.	

Friday Afternoon, February 25.

1.15	Drill	Pupils of Carrollton School.
1.30	How children may be taught to study	Miss Lida B. Earhart.
2.10	Lecture: From center to circumference	Dr. C. O. Hoyt.
3.00	Intermission.	
3.10	The art of study	Miss Lida B. Earhart.
3.50	Horace Mann	Dr. C. O. Hoyt.
4.35	Song, 89	Association.

Friday Evening, February 25.

7.45	Music	East Side High School.
8.00	Illustrated lecture: The greatest pictures in the world,	Mr. Preston W. Search.
9.30	Song, 28 (1 and 4)	Association.

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Program of institute and association meetings to be held January 7–8 and 14–15, 1910, at Chesaning and Bridgeport, respectively.

Addresses will be given by Prof. W. D. Henderson, of Ann Arbor, and J. C. Ketchum, of Hastings.

The public is invited to attend these meetings.

BURTON S. TEFFT,
Commissioner of Schools.

PROGRAM FOR BRIDGEPORT.[1]

Friday Evening, January 14.

7.30 Song.....Master George Gramlich.
7.40 Invocation.
7.50 Address.....Mr. J. C. Ketchum, Hastings.
9.00 Music.....Bridgeport Musical Club.

Saturday Morning, January 15.

9.30 Invocation.
9.35 How to conduct a spelling class.....Prin. Mark T. Davis.
9.50 Discussion.
10.00 How much orthography should be taught below the eighth grade? Prin. Harvey King.
10.15 Discussion.
10.30 Mental arithmetic substituted for written arithmetic....Miss Elizabeth Deno.
10.45 Discussion.
11.00 Suggestions on teaching the "Lady of the Lake," Members of the association.
11.30 Election of association officers.
11.45 Noon.

Saturday Afternoon, January 15.

1.15 Teaching civics in the grades.....Prin. Logan C. Sly.
1.30 Discussion.
1.45 Model class in story telling.....Miss Mamie Callahan.
2.00 Questions and discussions.
2.15 What to do for busy work.....Miss Sarah Fisher.
2.30 Discussion.
3.00 Topics for future discussion .....Members of the association.

INDIANA.

Program of institute held at Huntington, Ind., August 29 to September 2, 1910, inclusive.

Ira B. Potts, county superintendent.

Instructors: Dr. Ira W. Howerth, associate professor of sociology, University of Chicago; Mrs. Julia Fried Walker, Indianapolis, Ind., teacher, lecturer, editor; Prof. Thomas L. Gibson, Baltimore, Md., director of music in large assemblies; Miss Edna Hays, Albion, Ind., pianist; Mr. Jesse Ulrich, secretary.

First Day, Monday, August 29.

10.00 Devotional exercises.
10.10 Music.....Mr. Gibson.
10.25 Education and life.....Dr. Howerth.
11.05 Rest.

[1] This program, with a different set of speakers, was given at Chesaning on Friday and Saturday of the previous week.—W. C. R.

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11.30	Primary work	Mrs. Walker.
12.00	Adjournment.	
1.30	Music	Mr. Gibson.
2.00	Rest.	
2.15		Mrs. Walker.
3.00	Rest.	
3.15	The school of nature	Dr. Howerth.
4.00	Dismissal.	

Third Day, Wednesday, September 1.

9.00	Devotional exercises.	
9.10	The school of man	Dr. Howerth.
10.00	Rest.	
10.15	Music.	
10.45	Rest.	
11.00		Mrs. Walker.
1.30	Music.	
2.00	Rest.	
2.15	Competition	Dr. Howerth.
3.00	Rest.	
3.15		Mrs. Walker.
4.00	Adjournment.	

WEST VIRGINIA.

The following extracts are selected from the institute manual for 1910 prepared by M. P. Shawkey, State superintendent of schools:

ANNUAL STATEMENT OF PLANS.

(To be read before the Institute.)

Since the uniform examinations and official correspondence reveal the fact that many of our teachers do not read the department publications with sufficient care to get a clear understanding of our State school plans as emphasized in the teachers' institutes, I have decided to take a few minutes of the time of each institute in West Virginia to present briefly the problems which it is hoped the teachers will attack with vigor this year. The request for special attention to a few things does not carry with it the supposition that other work is to be slighted, but rather a belief that the good effects of concentration of effort on a few vital questions will overflow to the general work of the school.

BETTER ENGLISH TEACHING.

You will remember that this subject was much emphasized last year, but as long as many of our teachers say "I taken," "we done it," and make no attempt to discriminate between don't and doesn't, and as long as the applicants for teachers' certificates groan under the substitution of ordinary composition work for technical grammar, I believe this subject should be kept in the foreground. It is needless for me to remind teachers that the ability to use English correctly and effectively is a constant reminder of scholarship wherever we go or whatever we do. This distinction should be the heritage of every boy and girl who completes the common-school course in West Virginia, and teachers who fail to give their share of such a blessing fall short of their duty and opportunity. It is not the province of this paragraph to discuss method. Let the English work of the institute and schoolroom be sound and to the point, the kind of work that will first of all result in facility in the correct use of every-day English and lay a solid foundation for the further pursuit of this important subject.

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ART IN SCHOOL AND IN LIFE.

We are coming more and more to associate education with everything that makes life more abundant, and certainly no life can be truly rich unless the artistic sense is cultivated. We must recognize the fact that impressions, good or bad, pour in from our environment. During the plastic years of childhood the surroundings of school and home are surely and silently impressing themselves upon the sensitive plates of the child's mind, and these impressions form the basis of much of the adult's thought and character. How important then it is that the schoolroom with its neat, attractive appearance

"Hang beautiful pictures on Memory's wall."

Any teacher who is willing to read the articles contained in this Annual need no longer be ignorant as to the best thought upon "Art in the schoolroom," and from this time teachers will be expected to manifest special interest in this phase of work. Chase away the dirt, pull down the advertisement pictures, group a few small pictures on mats, and let our motto be "At least one large, well-framed picture in every schoolroom in West Virginia."

BETTER ATTENDANCE.

While we grow enthusiastic over the prospect of doing attractive things, we must tackle homely problems, such as attendance, with a bull-dog tenacity that knows no surrender. Extended comment is not necessary here as this topic will be much discussed in the institute. You know the parable of the man who prepared the feast and sent his servants out into the highways and hedges to compel guests to come in. While I have not the power to commission you, the law plainly states that you *must* do your part in compelling the youth of this State to partake of the school advantages which the Commonwealth has provided. The per cent of daily attendance of the total enumeration went from 47 to 52 last year and must go still higher this year. See to it that your school helps to raise rather than pull down this average. The teacher is the one person in the community to whom we look for constant help in all educational effort, and when the teacher fails to make the school interesting and efficient—when he fails to visit and encourage the careless and fearlessly report the negligent, we can not hope for effective results through the work of other officers.

A State Honor Roll book containing the names and addresses of all pupils in West Virginia who are neither absent nor tardy in 1910 will be published by the State department of schools. How many names will be furnished for this long list? Let us remember that this effort for better attendance is not made for the purpose of figures and percentages, but rather that educational blessings may come to more boys and girls and thereby more abundant living to each individual, and a higher standard of citizenship to our State.

Other problems will be presented from time to time through special bulletins and publications, and I earnestly ask that each teacher stand ready to respond to all reasonable requests. I assure you, one and all, that I recognize and appreciate the cheerful and valuable cooperation of West Virginia teachers and school officers in the past, and wish you abundant success in the future.

Program for Teachers' Institutes, 1910.

Monday Morning.

10.15 Opening devotional exercises.
Appointment of secretaries, reporters, committees, etc.
Enrollment.
Announcements and remarks by county superintendent.
Reading of "Annual statement of plans."
Short "getting acquainted" addresses by instructors.

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Monday Afternoon.

1.30 Music.
1.40 Instructor's topic.
2.50 Recess.
3.00 Round table discussion. (Round table discussions and other special parts to be taken by teachers must not be overlooked. Teachers should take pride in seeing that the period allotted to them is interesting as those used by instructors. Think carefully and speak with *point* and *vim.*)

Topics for this period.

1. How last year's institute helped me in my real school work.
2. How could last year's institute have been improved?
3. Some definite help I hope to receive in this week's institute.
4. Two weak points in our schools as they are.
5. Should the institute work be academic or professional?
6. What can be done to make this institute room more comfortable and attractive?

Monday Evening.

Annual social. Have a plan and make the occasion worthy of teachers in tone and usefulness.

Tuesday Evening.

Special program or lecture.

Wednesday Morning.

9.00 Devotional exercises, music, and memory gems.
9.10 English (continued).

Reading in grammar grades.

In spite of all that has been said about teaching reading, many (it may be a majority) of our teachers call a class, begin at one end, have them read in a meaningless, sing-song way 'round and 'round the class, say "Take the next lesson," have the pupils change the place of their "thumb cards" and wait till the machine turns round to reading time again.

Can the institute put some dynamite under such a hardened custom?

9.50 Art in the schoolroom.

Pictures.

Pictures that should not be in the schoolroom—advertisements, etc.

Where and how to secure them? (See companies and addresses on other pages.)

How can pictures be attractively framed and mounted with but little cost? Mats, passepartout, home framing.

Kinds of pictures appropriate for different grades and schools.

Pictures and artists that each teacher should know.

The real purpose of pictures in the schoolroom.

10.35 Recess.
10.45 English (continued).

Story telling:

Characteristics of a good story for children.

Characteristics of a good story teller.

Values and use of stories.

11.20 English (continued).

Exercise in story telling. Have three or four teachers who have prepared for this exercise tell short child stories. Apply the above tests to stories and story tellers.

12.00 Noon intermission.

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Wednesday afternoon.

1.30 Singing. (Sing with the understanding that you are to keep time and keep up.)
1.40 Instructor's topic.
2.10 Geography.

"O Jehovah, our Lord,
How excellent is thy name in all the earth!
Who hast set thy glory upon the heavens!
Out of the mouths of babes and sucklings hast thou established strength,
Because of thine adversaries,
That thou mightest still the enemy and the avenger.
When I consider the heavens, the work of thy fingers,
The moon and the stars, which thou hast ordained;
What is man, that thou art mindful of him,
And the son of man, that thou visitest him?
For thou hast made him but little lower than God,
And crownest him with glory and honor.
Thou makest him to have dominion over the works of thy hands;
Thou hast put all things under his feet:
All sheep and oxen,
Yea, and the beasts of the field,
The birds of the heavens, and the fish of the sea,
Whatsoever passeth through the paths of the seas.
O Jehovah, our Lord,
How excellent is thy name in all the earth!"

—Psalm VIII.

1. Does your geography aid in the interpretation and appreciation of such literature as the above? Do your pupils see much when they hear or read such expressions as "Thy glory upon the heavens;" "The work of thy fingers;" "The moon and the stars which thou hast ordained"?
2. Does your geography "Possess a human interest, showing the earth as the home of mankind and its adaptation to man's activities?" Do you put in your time with petty locations and routine questions when you should be teaching boys and girls to understand how "man has dominion" and that he brings our breakfast "through the paths of the seas" from the uttermost parts of the earth?
3. Do your maps have length, breadth, and thickness? Are they covered with letters and colors, or with rivers, mountains, farms, villages, cities and people?
4. Are you old-fashioned and wise enough to have much drill on important facts that should be common knowledge among all who claim a common-school education? The instructors and the teachers should agree upon a list of things to use for such drills.

2.35 Recess.
2.45 Round-table discussion—A teacher outside the schoolroom.

(Have some teacher open this discussion with a short talk or paper which has been previously prepared.)

1. In his study.

   What conveniences for home work should every teacher possess? How much time should he spend in study? What kind of work—preparation of lessons, professional reading or general reading—should have preference?

2. In society.

   Proper and improper social activities. Manners that should characterize a teacher in a social group. Care in keeping free from entanglements with the neighborhood cliques.

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3. In the open air.
   How may teachers provide for pleasant and profitable outdoor exercise or employment?
4. In professional circles.
   The deadening effect of isolation from inspirational influences. How much time can a teacher afford to give to reading circles, district institutes, and other educational meetings? Do principals and superintendents sometimes lessen the efficiency of teachers by requiring too much of them?
5. The teacher in the world.
   In times past teachers have not merited proper recognition as men among men. What can be done to give the teachers a better standing in the social and business world?

ILLINOIS.

Program of institute, Winnebago County, Ill., O. J. Kern, county superintendent, March 28 to April 1, 1910.

Conductors: W. R. Cheever, H. K. Bassett, Charles McMurry, Mrs. Edith Smith Davis, Mrs. Edward Pierce.

Forenoon—General sessions.

9.10– 9.30 Chapel exercises and music.
9.30–10.10 General pedagogy.....Cheever.
10.10–10.50 Morals, geography, United States history.....McMurry.
11.00–11.40 Elementary English and high-school work.....Bassett.
11.40– 1.30 Noon intermission.

Afternoon.

1.30– 2.10 Scientific temperance instruction in the public schools.....Davis.
General session.
2.20– 3.00 Sectional meetings:
(*a*) High school. High-school English, literature, reading, etc.....Bassett.
(*b*) Graded school. Reading.....McMurry.
(*c*) Country school. Reading.....Cheever.

Miscellaneous.

Wednesday.
3.00–3.30 Patriotic exercises under auspices of John A. Logan Camp, Sons of Veterans.
Monday, Tuesday, Thursday.
3.00–3.30 Conference of country school. Section.....County superintendent.

Program of the annual teachers' institute of Coles County, Ill., August 29 to September 2, 1910.

Instructors: David Felmley, president of the Illinois State Normal University, Normal, Ill.; DeWitt Elwood, superintendent of schools, Charleston, Ill.; G. P. Randle, superintendent of schools, Mattoon, Ill.; J. F. Wiley, principal Mattoon High School; Mrs. Elizabeth McNair, supervisor of music, Mattoon public schools.

Marietta A. Neel, superintendent Coles County schools.

Addresses 2.25 p. m.

August 29. Civics and health. Mr. DeWitt Elwood, superintendent schools, Charleston, Ill.

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August 30. The new demand in education. Dr. David Felmley, president Illinois State Normal University, Normal, Ill.
August 31. Some things the public schools may do in instruction in agriculture. Prof. G. W. Sutton, superintendent schools, Oakland, Ill.
September 1. The social conscience. Mr. Charles R. Adair, Charleston, Ill.
September 2. Hon. F. G. Blair, superintendent public instruction, Springfield, Ill.

Daily program.

9.10 Music.....Mrs. McNair.
9.30 Arithmetic, rural-school teachers.....Mr. Elwood.
High school and special teacher section.....Mr. Wiley.
History, grades.....Mr. Randle.
10.10 Pedagogy, entire institute.....Mr. Felmley.
10.50 Recess.
11.05 Physiology, rural teachers.....Mr. Elwood.
Civics and history of Illinois, graded, high school, and special teachers. Mr. Felmley.
11.45 Noon.
1.15 Music.....Mrs. McNair.
1.30 Beginners, first and second grades.....Mr. Felmley.
Arithmetic, grades (above second).....Mr. Elwood.
Grammar, rural (above second grade).....Mr. Randle.
2.10 Recess.
2.25 Address.
3.10 Music.
3.25 Conference.
4.05 Dismissal.

MASSACHUSETTS.

Program of Teachers' Institute under the direction of the State Board of Education, High School Building, South Framingham, Wednesday, April 28, 1909.

Members of school boards and the public are cordially invited to attend the exercises. It is hoped that there will be a large attendance of parents to listen to Dr. Harrington's address.

GEORGE H. MARTIN,
Secretary of the Board.

JOHN T. PRINCE,
Agent of the Board.

9.10 a. m.: Opening exercises.
9.20 a. m. to 10.10 a. m.:
Drawing, grades 1–3.....Frederic L. Burnham, Agent of the Board.
Geography, grades 4–6.....Charles P. Sinnott, Bridgewater.
History, grades 7–9.....Arthur C. Boyden, Bridgewater.
Uses of the recitation, high school....James W. MacDonald, Agent of the Board.
10.20 a. m. to 11.10 a. m.:
Arithmetic, grades 1–3.....John C. Gray, Chicopee.
Language, grades 5–6.....Miss Flora L. Kendall, Fitchburg.
Arithmetic, grades 7–9.....J. H. Carfrey, Wakefield.
Mathematics, high school.....Wallace E. Mason, North Andover.
11.20 a. m. to 12.10 p. m.:
Story telling, grades 1–3.....Miss Caroline G. Hagar, Fitchburg.
Reading, grades 4–6.....Mr. MacDonald.
Geography, grades 7-9.....Mr. Sinnott.
History, high school.....Mr. Boyden.

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INTERMISSION.

1.40 p. m. to 2.30 p. m.:
Language, grades 1–4.....Miss Kendall.
Drawing, grades 5–9.....Mr. Burnham.
2.45 p. m. General address, "Hygiene".....Dr. Thomas F. Harrington, Boston.

Program of Teachers' Institute, under the direction of the State Board of Education, Memorial Hall, Dighton, Friday, February 25, 1910.

Members of school boards and the public are cordially invited to attend the exercises. It is hoped that there will be a large attendance of parents to hear the general addresses.

DAVID SNEDDEN,
Commissioner of Education.

JOHN T. PRINCE,
Agent of the Board.

9.50 a. m.: Opening exercises.
10 a. m. to 10.35 a. m.:
The recitation.....Mr. Prince.
10.40 a. m. to 11.25 a. m.:
The new basis of method.....Mr. Snedden.
11.35 a. m. to 12.25 p. m.:
Language, grades 1–4.....Miss Katharine H. Shute, Boston Normal School.
Geography, grades 5–9.... Charles P. Sinnott, Bridgewater State Normal School.

INTERMISSION.

1.25 p. m. to 2.15 p. m.:
Geography and nature study, grades 1–4.....Mr. Sinnott.
Language and grammar, grades 5–9.....Miss Shute.
2.25 p. m.: Physiology and hygiene,
Miss Annie S. Crowell, Hyannis State Normal School.

BY WHOM ATTENDED.

That teachers' institutes are attended primarily by rural-school teachers is evident to all who have had any considerable experience with them. They are but slightly attended by city elementary-school teachers and almost never by high-school teachers. Indeed, the latter two classes are in some States exempted from attendance by law.

In Montana and in North Dakota high-school teachers are expressly exempted by law from attending institutes, and the laws of Louisiana, Missouri, North Dakota, Ohio, Pennsylvania, Texas, and Washington provide that separate institutes may be held for the teachers in cities. Louisiana exempts the Parish of Orleans from the institute law entirely and further specifies that all cities of at least 500 scholastics may hold separate institutes. The law of Texas also exempts cities with a school population of 500 or over. In Missouri the institute law does not apply to cities of 300,000 and over, while the institute law of North Dakota "shall not apply to high-school teachers, nor to teachers in cities organized for school purposes under a special law, nor to teachers in cities organized as

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independent districts." (S. L., 1909, p. 86.) The Ohio law merely exempts cities, without reference to their size, while in Pennsylvania and Washington the exemption is based on the number of teachers employed. In Washington, cities with more than 100 teachers may hold their own institutes; while in Pennsylvania, cities, boroughs, and townships having 40 or more teachers and superintendents of their own may have separate institutes under conditions similar to those of county institutes. In New York the teachers in cities having adequate supervision need not attend institutes.

North Carolina passed a law in March, 1911, providing that high and graded school teachers be included in the requirement that all teachers attend the biennial teachers' institute or an accredited summer school.

That institutes are attended primarily by rural-school teachers and by young and inexperienced persons who are preparing to enter the rural-school service is borne out by the published figures of a number of States. Supt. C. P. Cary, of Wisconsin, in his annual report for 1908, page 51, points out that about 90 per cent of those who attended institutes the preceding year were county teachers, and he laments the fact that normal graduates do not attend with more frequency and regularity.

A similar story comes from Kansas. According to the annual report of State Supt. E. T. Fairchild for 1908, pages 17–18, the institutes reported upon were attended by 11,255 teachers. Of these 15 per cent were male and 85 per cent female, and they averaged 20⅘ years of age. Only slightly over 25 per cent were high-school graduates, less than 10 per cent had work beyond the high school, and 43 per cent were without experience. But the most striking fact to note in this connection is that only 1,310, or 11.5 per cent, were graded school teachers. This leaves over 88 per cent who were either teaching in rural schools or who were aspiring to do so. The superintendent concludes his discussion of these figures by saying: "Clearly, the course of study and the work in the institute should be made chiefly to fit the needs of those who are inexperienced and who are to teach in the rural school." The work, he suggests, should be primarily professional, a definite academic foundation being assumed.

FUNCTION AND PROBABLE DESTINY OF TEACHERS' INSTITUTES.

The purposes of teachers' institutes are described as follows in the institute manuals issued by Kentucky in 1909, by West Virginia in 1910, and in the foreword to the institute program prepared by Supt. Ira B. Potts for Huntington County, Ind., for 1910:

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KENTUCKY.

PURPOSE OF INSTITUTE WORK.

The main purpose of all institute work is to develop teaching and training power.

By teaching power is meant the power which is exerted to the end that the pupil may know that which is worth knowing, and by training power is meant the power which is exerted to the end that the pupil may do and be that which is worth his doing and being.

Teaching and training power involve—

1. Accurate knowledge of the subject matter to be taught and an appreciation of the character and extent of the training to be given.

2. Ability to organize and arrange in logical order the matter to be taught and the training to be given.

3. A knowledge of the mental processes involved in the mastery of any body of knowledge and of the present condition of the pupil's mind as related to that body of knowledge.

4. Skill in calling into action at the right time the mental processes required in learning and training.

5. Knowledge of the essentials of school management and skill in management.

6. Sympathy and tact.

7. Correct ideals of what in the subjects taught is useful for knowledge and training, and for securing the desired results from training. Correct ideals of the necessary training outside the course of study and of the proper modes of securing the desired results from such training. Correct ideals of the teacher's preparation for work and responsibility for results.

Growth in teaching and training power in an institute depends upon the character and amount of work done by the teachers individually in the institute. The skill of the institute conductor is shown not in the amount of talking he does, but in the amount of the right kind of work which he succeeds in getting the members of the institute to do in preparation for the institute exercises and in the institute exercises. This statement is true whether applied to academic or professional work.

In the determination of any purpose which the institute exercise is designed to realize the institute conductor should ask himself, "What end will this purpose serve?" In determining the mode of conducting the exercise for the realization of this purpose he should ask himself in advance, "What will come of it?"

WEST VIRGINIA.

THE GENERAL PURPOSES OF THE INSTITUTE.

There is much discussion these days among those most interested in educational affairs as to the worth of the county institute. There is a disposition on the part of some thinkers to do away with this phase of school work and substitute summer schools or more district institute work in its stead. But inasmuch as it has stood the test for so many years, it seems that it fills a peculiar mission in our school scheme. Below are stated a few of the purposes of the institute as I conceive them:

1. To bring teachers together for social and professional acquaintance.

2. To afford an opportunity for teachers to secure such insight into proper methods as will make it possible for them to teach with more ease and pleasure to themselves and more fruitful results for the pupils.

3. To furnish abundant professional inspiration, which should be the motive power that leads the teacher to keep himself at his highest efficiency throughout the year.

4. To bring together teachers, school officers, and patrons to the end that the attitude of one toward the other may be more intelligent and sympathetic.

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5. To create a stronger "body spirit" that will cause the teachers to carry out in unison the larger school plans of the State or community. This is one of the main objects which the institutes should accomplish this year. When teachers of West Virginia learn to keep step, they can easily march straight to victory in school matters. Let us have a professional zeal that will cement us together and thus add the combined strength of all to whatever problems we may wish to attack.

6. To give definite instruction in affairs of school administration that will assist the teachers in the proper solution of any difficulties which may arise in the actual work from day to day.

Instructors, county superintendents, and teachers should note these purposes and examine themselves from day to day to see whether any of these things are being accomplished. If such examination reveals the fact that the institute is lacking in respect to these purposes, the cause should be sought out and the proper remedy applied.

INDIANA.

Some of the reasons given for a county assemblage of teachers are: Academic instruction, help in school organization and in the mechanics of the recitation, promotion of sociability and good will among teachers, giving teachers a feeling of dissatisfaction with their present attainments, help in methods of teaching particular subjects, giving deeper insight into the principles of education and how the work of the school may function in harmony with those principles, inculcating a more zealous professional spirit, etc.

Briefly, it seems that the functions of the institute are two in number—the meeting of the immediate practical needs of the teachers and the giving of inspiration.

The institute problem is a hard one to solve. We have as learners 200 persons of different degrees of maturity, experience, and scholarship. Some are working with tiny tots 6 years of age, and others with grave and omniscient seniors, and still others at various places along the line in the educative process. How may an institute be helpful to such an apparently heterogeneous body?

There is one ray of consolation in all this mass of complexity, i. e., the fundamental principles of education are everywhere the same. The wise worker in any field is he who is able to bring all he hears and sees to bear on the solution of his specific problems. He has the power of adaptation.

The wise teacher will not expect a county institute to furnish a panacea for all educational ills. He will hardly expect to secure a lever that will enable him to pry out any snag that may loom up in his path.

He may reasonably expect to get a firmer grasp of certain vital principles in education, which he may adapt to the varying needs and capacities of the learners under his charge. We believe that every teacher, old and young, who has not definitely solved and pigeonholed all the problems of education will find something of value in the work given.

Newton Bateman, superintendent of public instruction in Illinois for the years 1859–1863, in his report for 1859–60, eloquently elaborated the following benefits to be gained from teachers' institutes:

1. Professional knowledge and insight.
2. Help in specific difficulties.
3. The proper discipline of schools.
4. Quickening of the professional spirit, the esprit du corps.
5. Social acquaintance and friendship.
6. Community benefits:
   (1) Public is aroused to the importance of education.
   (2) True educational standards are set before the people.
   (3) Mutual confidence and good understanding are established between the people and school officers and teachers.

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All these benefits no doubt have accrued and do still accrue from teachers' institutes, but no one could claim that they can be obtained only through institutes. Training schools, teachers' meetings, and teachers' associations, assisted by professional reading, also confer them.

When one reads the literature pertaining to teachers' institutes that appeared from the middle to the latter part of the nineteenth century, one is impressed with the optimistic note that runs through nearly all of it. While recognizing limitations of institutes, owing chiefly to the brevity of their sessions, leaders like Horace Mann, of Massachusetts, and Newton Bateman, of Illinois, nevertheless spoke unstintingly of their value, and John Hancock,[1] of Ohio, even went so far as to place their professional influence above that of normal schools on the ground that they reached more teachers. Only occasionally was the value of the institute as a permanent institution questioned.

But a different note has appeared in the more recent expressions of a number of educators. John T. McManis, in discussing the "Problems of the institute" in the Elementary School Teacher for December, 1903, says:

> The question of the teachers' institute is receiving a good deal of attention from educators at the present time. The discussions indicate general dissatisfaction with the manner of conducting the institute and with the practical returns made in consideration of cost. * * * The fact is the institute, as we have it at present, is a fossil. Its life history belongs to a time when conditions were different from the present. When the teaching element and interests were more largely rural in their make-up than they now are, when facilities for academic and professional instruction were not general, and when summer sessions of regular institutions were not within the reach of practically all teachers, then, indeed, the institute performed a positive function as a means of carrying valuable educational material. * * * The institute, then, in the form it has been handed down to us, is out of place.
>
> There is scarcely anything less pedagogical than the work of the ordinary institute. Why the lecturer should violate nearly all the canons of modern education is strange, considering the fact that he talks so glibly about these same principles. Very likely he will preach "self-activity" in education, and strictly assume a passive set of individuals to teach. He pours forth his thoughts, if they can always be dignified with that title, without considering whether they meet a response or not. If he can perform the antics of a clown, his listeners are tickled into following him, and they may think they have received a great deal, whether they have or not; if he is dry and tedious, they yawn as he proceeds and cheer when he is through.
>
> A second violation of educational principles is like unto the first, namely, the haphazard characteristics of the material usually presented in the institutes. I refer to the plan of taking up work on which the teachers have made no preparation, or which has no definite relations to work they have already been doing, and on which they can not have many questions.

[1] Proceedings of the Department of Superintendence, N. E. A., 1889, p. 71.

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A similar line of criticism is voiced by Homer H. Seerley in an article on the "Practical value of the institute system," in the "Educational Review" for November, 1908. He says:

The institute system has been a makeshift and was not originally intended to be a permanent part of the educational system of any State. Its inauguration and maintenance by most of the States has been due to the lack of means to educate teachers more systematically and to lack of disposition, on the part of those who begin teaching, to go to the trouble to prepare properly for the vocation.

There is no doubt but the institute system, when managed by specially competent persons, has been a benefit to the work of elementary education in the formative periods of most of the States; but it has also had the counter effect of making teachers satisfied with minimum educational qualifications, and with empirical training, so that the majority of them have long since concluded that when they have enough scholarship to secure a brief license to teach, and have added to this annual attendance at the teachers' institute, they have shown sufficient professional evidence of their individual capability as educators. * * * Later movements (the various types of summer schools) have not been accepted uniformly as fair substitutes for the institute, and, hence, in many instances those in authority over the teachers have compelled institute attendance in preference to this more extended study, thus discouraging the real substantial efforts they are making for improvement. This has been due to fear of loss of financial support through loss of numbers enrolled and, hence, to loss of control and to other reasons that are official and personal. * * * The constant change of county superintendents, the introduction of new and inexperienced instructors, the rising and falling of State superintendents through frequent elections, have each had a decided effect upon keeping the institute system glorified and magnified from year to year.

The actual results claimed for institutes are usually greatly overestimated by those who conduct them. They allow their enthusiasm to direct their judgment, they accept appearances as results because they assume that the work they have done is specially effective and positively permanent. They have no definite way to determine the facts, or to summarize the opinion of the teachers, and the estimates they make are often more or less visionary and unreliable. Those who follow the business of conducting these annual assemblies, whose vocation depends on the system and who are firm believers in the system, more because they do not know anything better to do for the teachers than because of its real excellence or its efficiency, could hardly be supposed to be unprejudiced witnesses.

If these arraignments of institutes were isolated examples, they might be passed by unnoticed, but of late years expressions of a similar nature have become sufficiently frequent to arrest attention. The feeling is beginning to spread that institutes have served their usefulness and should be discontinued.

It is no doubt true that institutes, as they are still usually conducted, are an anachronism. They arose in the second quarter of the nineteenth century, before the normal schools had made much headway and when summer schools for teachers were unknown, to supply a distinct need in the training of teachers. Their sessions at that time were seldom less than two weeks in length, and often considerably longer, and they were conducted somewhat on the plan of schools in which all the teachers took an active part. The teachers,

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according to Horace Mann,[1] "formed themselves into classes in all the branches they expected to teach; they studied lessons and performed recitations, just as is done in school."

It is significant to note, too, that when institutes arose they displaced many common-school conventions and county teachers' associations that held short meetings annually or semiannually. Horace Mann spoke of this in his Eighth annual report, page 71, and regretted it, for he thought that these conventions were especially effective in serving as educational revivals among the people, a merit that the more formal institute would possess in a less degree. He thought the sacrifice was worth the price, however, and concluded: "The institute may effect less in interesting the citizens at large; but it will accomplish far more in qualifying teachers for their duty."

This beginning of institutes and the displacement of teachers' conventions by them are of interest in this connection because these data seem to give us the key to the ultimate outcome of institutes. To rail against institutes in a general way does little good. What is needed is an adequate conception of their nature and function in the light of their origin, and with this information at hand it may be possible to infer something in regard to their destiny.

The typical teachers' institute at one and the same time serves (1) as a professional training school for teachers; (2) as a teachers' meeting, in which the appointed authorities acquaint the teachers with the educational policies of the State or county, and with what is new and inspiring in educational thought; and (3) as a teachers' convention or association, whose purpose is largely social. If we are to gain an adequate conception of institutes and their function, we must treat these three aspects separately, and if institutes are ever to reach a stable footing, they must differentiate themselves into these three distinct institutions. This means, of course, that the traditional institute will disappear, at least in substance if not in name, and that it will be replaced by summer normal schools, by official county and district teachers' meetings, and by voluntary county and district teachers' associations.

The feature of the institute that has been the most frequent target of criticism, that was often looked upon askance, even in the early days, is the training-school feature. This feature has always been regarded by many people as a temporary makeshift, to serve until a more adequate system for the training of teachers had evolved; for it is self-evident that 5 days, or even 10 days, a year is too short a time for the professional, to say nothing of the academic, culture of the teacher.

[1] Eighth annual report, p. 69.

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TABLE I.—*Teachers' institutes,*

	State.	Laws or session of—	Nature.	Number. a year.	Territory.	Length.	When held.	Attendance.
	1	2	3	4	5	6	7	8
1	Alabama	1911	Institute	1	County	5 days	July to October.	Compulsory.
2	Arizona	1907	Institute	1	do	3 to 5 days.		do
3	Arkansas	1911	do	1	do	5 days	June	do
4	do	1909	Normal	1	do	8 or 9 weeks.	April to June	
5	California	1911	Institute or meeting.	1	County or city.	3 to 5 days.	Set by county or city superintendent.	Compulsory.
6	Colorado	1911	Normal	1	15 districts	6 weeks	Set by committee.	do
7	Connecticut.	1910	Institute. (?) [1].	113 (1907-8)	At convenient places.	Usually 1 day.		
8	Delaware	1909	do	1	County	3 days	Set by county superintendent.	Compulsory.
9	Florida	1910	Normal	3; 2 white, 1 colored	State	6 weeks	June and July.	Optional.
10	Georgia	1910	Institute	1	County	5 days	June, July, and August.	Compulsory.
11	Idaho	1909	do	1	do	5 to 15 days	Set by county superintendent.	Compulsory 5 days.
12	do	1909	Normal	3	State	6 weeks	Summer	Optional.
13	Illinois	1909	Institute	1	County	At least 5 days.	Usually in vacation.	do
14	Indiana	1909	do	1	do	5 days	Usually in August and September.	
15	do	1909	Meeting	1	Township		Before schools open.	
16	do	1909	do		do	1 day	1 or 2 Saturdays a month.	Compulsory.
17	Iowa	1911	Institute. (?)	1	County	At least 6 days.	Vacation	Optional.
18	Kansas	1909	Normal	1	do	At least 4 weeks.	Summer	do
19	Kentucky	1908	Institute	1	County	5 to 10 days	July to November.	Compulsory.
20	do	1908	Meeting (association.)	1 county, 1 district	County and magisterial districts.		During institute.	do

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meetings, and summer normals.[1]

Compensation or credit.	Penalty.	Support.	Organized by—	Work assigned by—	Instructions secured by—	
9	10	11	12	13	14	
.....	License revoked.	State, $5,000 white, $1,500 colored, fee 50 cts. to $1.	County board of education.	County board of education.	County board of education.	1
Regular salary, 10-cent mileage.	.....	Examination fees, 5 per cent territorial fund	County superintendents.	.....	.....	2
Regular salary, license extended.	License revoked.	License fees.....	County superintendent and State board.	State superintendent.	.....	3
.....	.....	.....	.....do.....	Prescribed by law.	Taught by county superintendent.	4
Regular salary...	.....	License fees, county $200 to $300.	County or city superintendents.	County or city superintendents.	County or city superintendents.	5
5 per cent added to average standing.	.....	Registration fees, license fees, special appropriations, county $2 each enrollment.	Committee, 3 county superintendents, State normal school board.	Committee....	Committee, instructors licensed by State board of education.	6
.....	.....	State $3,000.....	State board of education.	State board of education.	State board of education.	7
Regular salary...	Forfeit salary	Registration fees, State $150 each.	County superintendent.	County superintendent.	County superintendent.	8
None.....	None.....	State $4,000.....	State superintendent.	State superintendent.	State superintendent.	9
Board may allow salary.	Fine.....	County $25.....	State school commissioner, county school commissioners.	State school commissioner.	County school commissioner, county board of education.	10
Schools closed; regular salary.	License revoked.	License fees, county $150.	County superintendent.	County superintendent.	County superintendent.	11
.....	.....	State $1,000, registration fee $5.	Commission, State board of education, president normal schools.	Commission...	Commission....	12
Salary in term time, renewal of certificate.	.....	License fees, registration fees.	County superintendent.	County superintendent, State superintendent.	County superintendent, State superintendent.	13
2 per cent added to average standing.	.....	County $100, voluntary fees.	.....do.....	County superintendent.	County superintendent.	14
.....	.....	.....	.....do.....	.....do.....	Held by county superintendent.	15
Regular wage....	1 day's pay..	.....	Township trustee.	Township trustee.	Held by township trustee.	16
.....	.....	License fees, county.	County superintendent.	County superintendent, State superintendent.	County superintendent, State superintendent.	17
.....	.....	License fees, registration fees, county $100, State $50.	.....do.....	County superintendent.	County and State superintendents licensed by State board of education.	18
Schools closed; regular salary.	License revoked.	Registration fees	County superintendent.	State committee.	County superintendent.	19
.....	Teach additional day.	.....	County superintendent ex officio president.	ounty superintendent.	....	20

[1] Meetings which might have been classed differently are followed by an interrogation point.

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TABLE I.—*Teachers' institutes, meet*

	State.	Laws or session of—	Nature.	Number. a year.	Territory.	Length.	When held.	Attendance.
	1	2	3	4	5	6	7	8
21	Louisiana...	1911	Institute.....	1.....	Parish [1].....	Usually 5 days.	Set by State board.	Compulsory.
22	.....do.....	1910	Normal.....	5 white....	State.....	4, 9 weeks; 1, 6 weeks.	Summer....	.....
23	.....do.....	1910	Meeting.....	About 8...	Parish.....	1 to 2 days.	First Friday and Saturday of the month.	Compulsory.
24	Maine.....	1909	Association. (?)	1 or 2.....	County.....	1 to 3 days.	.....	.....
25	.....do.....	1909	Normal.....	At least 4..	State.....	2 to 3 weeks.	Summer....	.....
26	Maryland...	1910	Institute.....	1.....	County.....	At least 5 days.	Set by State superintendent.	Compulsory.
27	Massachusetts.	1909	.....do. (?)....	16 held in 1909.	At least 3 towns.	1 to 2 days	.....	.....
28	Michigan....	1909	.....do.....	1.....	County.....	Set by State superintendent.	Set by State superintendent.	.....
29	.....do.....	1909	.....do.....	1 or more..	State.....	.....do....	.....do.....	.....
30	Minnesota...	1909	.....do.....	Usually 1 .	County.....	At least 4 days.	.....do.....	.....
31	.....do.....	1910	Normal.....	32.....	.....	4 to 6 weeks.	Summer....	Optional.
32	.....do.....	1909	Meeting.....	5.....	Sections of county.	1 day.....	Set by county superintendent.	.....
33	Mississippi..	1906	Institute.....	1.....	County.....	At least 5 days.	July and August.	.....
34	Missouri....	1909	.....do.....	1.....	.....do.....	3 days.....	September to December.	Compulsory.
35	Montana....	1909	.....do.....	1.....	.....do.....	3 to 10 days	Usually September to January.	...do.....
36	Nebraska...	1909	.....do.....	1.....	.....do.....	At least 5 days.	June, July, and August.	...do.....
37	.....do.....	1910	.....do. (?)....	1.....	State.....	5 days....	.....	.....
38	.....do.....	1910	Normal.....	8.....	State.....	8 weeks...	Summer....	Optional.
39	Nevada.....	1911	Institute.....	Even years	State.....	4 to 10 days	Set by State superintendent.	.....
40	.....do.....	1911	.....do.....	Odd years.	5 districts....	...do	.....do.....	Compulsory.
41	.....do.....	1911	.....do.....	.....	County.....	.....	.....	...do.....
42	New Hampshire.	1909	.....do. (?).....	1 or more..	.....do.....	Usually 1 day.	Set by State superintendent.	.....

[1] Equals county.

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ings, and summer normals—Continued.

Compensation or credit.	Penalty.	Support.	Organized by—	Work assigned by—	Instructions secured by—	
9	10	11	12	13	14	
Schools closed; regular salary.	Forfeit 2 days' pay.	License fees, registration fees, fines, State.	State board of institute managers.	State board of institute managers, State institute conductor.	State board of institute managers.	21
License extended or 15 points on examination, academic credit.	.....	State.....	State institute conductor.	State institute conductor.	.....	22
.....	1 day's pay..	Institute fund...	Parish superintendent.	.....do.....	Parish superintendent.	23
Board may close school 2 days and allow regular salary.	.....	State $1,000, voluntary fees.	30 teachers, State superintendent.	Committee of teachers.	State superintendent.	24
.....	.....	State $2,500	State superintendent.	State superintendent.	.....do.....	25
Regular salary...	.....	County.....	State superintendent, county superintendent.	State superintendent, county superintendent.	State superintendent, county superintendent.	26
.....	.....	$350 each (State), $3,000 a year.	25 teachers, State board of education.	State board of education.	State board of education.	27
Regular salary...	.....	Annual fees, State $100.	State superintendent.	State superintendent.	State superintendent.	28
.....do.....	.....	State $400.....	.....do.....	.....do.....	.....do.....	29
Allowed to make up time.	.....	State $3,000, county.	.....do.....	.....do.....	.....do	30
.....	.....	State $30,000....	.....do.....	.....do.....	.....do	31
.....	.....	County $50.....	County superintendent	County superintendent.	Held by county superintendent.	32
.....	.....	Examination fees, license fees, county $50.	County board of education.	County board of education.	County board of education.	33
Regular salary...	.....	30 per cent of license fees, dues permitted.	County superintendent.	County superintendent.	County superintendent.	34
.....do.....	License revoked	License fees, county $100 to $300.	.....do.....	.....do.....	.....do	35
.....	.....do.....	License fees, registration fees, county $25 to $100.	.....do.....	.....do.....	.....do.....	36
.....	.....	.....	State superintendent.	State superintendent.	State superintendent.	37
Academic credit.	.....	State $20,000, fees, etc., $10,000 biennally	.....do.....	.....do.....	.....do.....	38
.....	.....	State $200.....	State superintendent.	State superintendent.	State superintendent.	39
Regular salary...	Suspension..	State $150.....	.....do.....	.....do.....	.....do.....	40
.....do.....	.....do	State $100.....	State superintendent, county board of education.	.....do.....	.....	41
Regular salary, 1 day each term.	.....	State.....	State superintendent.	.....do.....	State superintendent.	42

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TABLE I.—*Teachers' institutes, meet*

	State.	Laws or session of—	Nature.	Number. a year.	Territory.	Length.	When held.	Attendance.
	1	2	3	4	5	6	7	8
43	New Jersey.	1908	Institute.....	Set by State superintendent.	County	2 to 3 days.	Set by State superintendent.	Compulsory.
44	New Mexico	1909	.....do.(?).....	1.....	.....do.....	2 to 4 weeks	Usually in August.	...do.....
45	New York...	1909	.....do.....	1.....	School commissioner's district.	Usually 5 days.	.....	...do.....
46	North Carolina.	1911	.....do.....	Biennial..	County.....	2 weeks...	.....	...do.....
47	North Dakota.	1909	.....do.....	Set by State superintendent.	.....do.....	Usually 5 days.	.....	...do.....
48	.....do.....	1908	Normal.....	7.....	.....	3 to 6 weeks.	Summer....	.....
49	.....do.....	1909	Meeting.....	Monthly..	County or sections.	1 day.....	Saturday....	Compulsory.
50	Ohio.....	1908	Institute.....	1.....	County.....	At least 4 days.	Set by State commissioner.	.....
51	Oklahoma...	1911	.....do.(?).....	1.....	....do.....	2 to 4 weeks.	Usually June and July.	.....
52	Oregon.....	1911	.....do.....	1.....	.....do.....	At least 3 days.	Set by county superintendent.	Compulsory.
53	.....do.....	1909	Meeting.....	3.....	Parts of county.	Set by county superintendent.	.....do.....	.....
54	Pennsylvania.	1911	Institute.....	1.....	County.....	At least 5 days.	.....do.....	Compulsory.
55	Rhode Island.	1910	.....do.(?).....	.....	Town.....	Usually 1 day.	.....	.....
56	South Carolina.	1908	.....do.(?).....	1.....	County.....	Usually 2 weeks.	Summer....	.....
57	South Dakota.	1909	.....do.....	1 or more..	.....do.....	At least 5 days.	Apr. 1 to Sept. 15.	Compulsory.
58	.....do.....	1909	Meeting.....	2 to 4.....	Districts....	3 hours....	Saturday once in 2 months.	..do.....
59	Tennessee...	1910	Institute.....	1.....	County.....	5 to 10 days	June and July.	Optional.
60	.....do.....	1910	Normal.....	5 to 10.....	State.....	4 weeks...	Summer....	...do.....

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ings, and summer normals—Continued.

Compensation or credit.	Penalty.	Support.	Organized by—	Work assigned by—	Instructions secured by—	
9	10	11	12	13	14	
Schools closed; regular salary.	Loss of salary.	State $4,000	State superintendent, county superintendent.	State superintendent.	State superintendent.	43
Third-grade teachers paid $15 for 4 weeks' attendance.	License withheld.	State $50 to $100 each, registration fees.	County superintendent.	Territorial superintendent.	County and Territorial superintendent licensed by Territorial board of education.	44
Regular salary; salary in vacation by contract.	License revoked.	State about $50,000.	State commissioner, school commissioner.	State commissioner.	State commissioner.	45
	do	County $200 to $250.	State superintendent, county superintendent.	Superintendent teacher training, State superintendent.	Superintendent teacher training, State superintendent.	46
Regular salary 4 or 5 days.	do	Examination fees, State $50, county $50.	County superintendent, State superintendent.	State superintendent.	State superintendent, county superintendent.	47
		Institute fund	State superintendent, county superintendent.	do	do	48
	1 day's pay.		County superintendent.	County superintendent.	Held by county superintendent.	49
Regular salary; $2 a day in vacation for 4 to 6 days.		Examination fees, registration fees.	30 teachers	County committee.	County committee.	50
Regular salary; renewal of license.		Examination fees, registration fees, county $200.	County superintendent.	State board of education.	County superintendent, certified by State board of education.	51
Regular salary	License revoked or refused.	Examination fees.	do	County superintendent, State superintendent.	County superintendent.	52
		Institute fund	do	County superintendent.	Held by county superintendent.	53
$3 a day	Forfeit equal to amount of stipend.	County $100 to $200.	do	do	County superintendent.	54
		State $500	State commissioner, town authorities.			55
		State	State educational campaign board, county superintendent.	Educational campaign board, county superintendent.	Educational campaign board, county superintendent.	56
Regular salary	$1.50 deducted from salary.	County at least $150.	do	do	County superintendent from list sent by State superintendent.	57
$2 and 5-cent mileage.	do		do	do	Held by county superintendent.	58
		Local contributions, fees.	County superintendent.	County superintendent.	County superintendent.	59
			State superintendent.	State superintendent.	State superintendent.	60

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TABLE I.—*Teachers' institutes, meet*

	State.	Laws or session of—	Nature.	Number a year.	Territory.	Length.	When held.	Attendance.
	1	2	3	4	5	6	7	8
61	Texas	1909	Institute	1	County	5 days	First 4 school months.	Compulsory.
62	....do	1910	Normal	116 (73 white, 43 colored).	State	6 to 8 weeks.	Summer	
63	Utah	1909	Institute (meeting).	1	County	2 to 10 days	Usually in summer; may be held 1 or 2 days a month.	Compulsory.
64	Vermont	1908	Institute (?)	Annual or biennial.	....do	1 to 4 days.	Set by State superintendent.	
65	....do	1908	Normal (?)	Usually 3 or 4.	County or several joined.	2 to 4 weeks.	Summer	
66	Virginia	1910	....do	19 (12 white, 7 colored).	State	At least 4 weeks.	....do	Optional.
67	....do	1910	Meeting	1	County	2 days	October and November.	Compulsory.
68	Washington.	1909	Institute	1	....do	At least 5 days.		...do
69	West Virginia.	1909	....do	1 or more	....do	5 days	Third week in July to last week in October.	...do
70	....do	1909	Meeting	1 or more	District	1 day	Usually Friday.	
71	Wisconsin	1909	Institute	1 or more	County	5 to 10 days	Usually summer and fall.	Optional.
72	Wyoming	1909	....do	1	....do	At least 5 days.	Set by county superintendent.	Compulsory.

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ings, and summer normals—Continued.

Compensation or credit.	Penalty.	Support.	Organized by—	Work assigned by—	Instructions secured by—	
9	10	11	12	13	14	
License extended; regular salary in term time or vacation.	License revoked.	Available State, county, and local funds.	County superintendent.	County superintendent, State superintendent.	County superintendent.	61
.....	.....	Registration fees $5.	State superintendent.	State superintendent.	State superintendent.	62
Regular salary...	License revoked.	County $100.....	Committee, State superintendent, principal normal school, county superintendent.	Committee....	Committee.....	63
.....do.....	.....	State $30 a day..	State superintendent, examiner.	State superintendent, examiner.	State superintendent, examiner.	64
.....	.....	State $25 a day, $50 a day for joint, for 10 days.	.....do.....	.....do.....	.....do.....	65
Advantages in securing certificates.	.....	State $18,000, local contributions $20,000.	State superintendent.	State superintendent.	State board of education.	66
Salary usually allowed.	Loss of salary.	No paid instructors.	Division superintendent.	Division superintendent, State examiners.	Conducted by division superintendent and State examiners.	67
Regular salary: salary in vacation.	Salary lost; license revoked.	License fees, county.	County superintendent.	County superintendent.	County superintendent.	68
$1.50 a day.....	.....do.....	Registration fees, State $100 each.	State superintendent, county superintendent.	State superintendent.	State superintendent.	69
Regular wage....	.....	.....	County superintendent.	County superintendent.	Held by county superintendent.	70
Salary may be allowed.	.....	State $23,000.....	.....do.....	State superintendent.	County superintendent, certified by State superintendent.	71
Regular salary...	.....	County $100.....	.....do.....	County superintendent.	County superintendent.	72

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SUMMER SCHOOLS.

The institutions that are rapidly taking over the function of the supplementary training of teachers formerly possessed by the institute are the various types of summer schools. These institutions, like the institute, reach the teachers that are in service during the school year, but because of their longer sessions they far outrank the institute in the opportunities they offer for both academic and professional culture.

The summer schools that are planned to reach the rank and file of the teachers may be conveniently grouped into three classes: (1) Summer normal schools, (2) summer sessions in normal schools, and (3) summer sessions in colleges and universities.

SUMMER NORMAL SCHOOLS.

By summer normal schools are meant those summer schools that are established by law independently of colleges and normal schools. They are below college grade, and are planned to reach, primarily, those persons who, without previous technical training, are aspiring to become teachers and those who, having already entered the calling without adequate preliminary training, are in need of further education of an elementary sort. These are precisely the classes of persons to whom the old-time institute was intended to bring a modicum of professional culture.

The summer normal schools are well qualified to take over the training function, which was the heart of the institute. They usually continue in session from 3 to 12 weeks, instead of that many days, are conducted definitely on the plan of schools in which lessons are prepared and discussed, and in a number of them standard educational credits may be earned by passing examinations at the close of the work. This enables the teachers already in service not only to add to their academic and professional equipment in a general way, but to prepare themselves in the classroom for higher diplomas and certificates without giving up their teaching positions; and the persons without training and experience can here receive a preliminary training that is far in advance of that given by the ordinary institute.

The point of definite and standard educational credit that may be earned by the work in summer schools should be emphasized, because this sets an aim for the work that has a most salutary effect upon the student. We are all so constituted that we need the stimulating and the coordinating effect produced by a goal ahead, and it is by no means without avail to have the achievement of this goal socially and officially recognized by means of a standard diploma or certificate.

The dividing line between institutes and summer normal schools is not always distinct. The meetings given questionably as institutes in Table I for New Mexico, Oklahoma, and perhaps for Iowa and

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South Carolina should probably have been classed as summer schools and described in this section. They are called institutes, or normal institutes, in the laws, but the descriptions given them would class them as summer schools.

The institutes in New Mexico and Oklahoma continue in session from 2 to 4 weeks; in Colorado and South Carolina, 2 weeks; in Iowa, from 6 to 16 days. However, it may be questioned whether any meeting of teachers with less than a 4-weeks' session is entitled to the designation of summer normal school.

The effect that summer schools may have on institutes is well illustrated by a law passed in Wisconsin in 1909, and which went into force July 1, 1910. The law reads, in part, as follows:

> Every applicant for a third-grade certificate * * * shall have attended a professional school for teachers for at least six weeks, and shall have received in such school standings in school management and in the methods of teaching reading, and language, arithmetic, and geography. (S. L., 1909, p. 71.)

The effect of this law is described as follows by State Supt. C. P. Cary, in a letter to the author:

> In consequence of this law, there are this summer (1910) 19 summer schools for teachers, enrolling about 4,000 students. These schools have taken the place of the one and two weeks' summer institutes which have for many years been held in practically every county of the State. There will be some institutes held during the year in various parts of the State, but these will probably be for only two or three days, and will come in the months when schools are in session.

If this appears like an abnormally sweeping effect from the mere legal recognition of a six weeks' professional school, this will be explained by the following extract from Supt. Cary's pamphlet on "How to Have a Good School." In addition to providing that the applicant for a third-grade certificate shall have attended a professional school for teachers for at least six weeks, this law further provides:

> (*a*) That not more than three third-grade certificates shall be granted to the same person after July, 1910.
>
> (*b*) That third and second grade certificates may be renewed without examination if the holder shall, during the life of the certificate, attend a professional school for teachers for a period of at least six weeks and shall receive in such school credit in at least two subjects.
>
> (*c*) That a first-grade certificate may be renewed for one or more five-year periods if the holder has taught successfully for ten years.
>
> (*d*) That the county or the city superintendent may transfer standings from a third-grade certificate to a second-grade and from a second-grade to a first if the applicant has proved a successful teacher, has attended a professional school for at least six weeks, and has received credit in at least two subjects.
>
> State normal schools, county training schools, schools outranking high schools and offering courses equivalent to those offered in any session of the State normal schools or in an institute of not less than six weeks maintained under direction of the normal regents are "professional schools."

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This displacement of institutes by summer schools has been practically duplicated in Florida, Kansas, Minnesota, and Virginia.

Summer normal or training schools are scheduled in Table I for 14 States. These are Arkansas, Colorado, Florida, Idaho, Kansas, Louisiana, Maine, Minnesota, Nebraska, North Dakota, Tennessee, Texas, Vermont, and Virginia. Wisconsin is not included in this list because the schools noted on the preceding page are not legally established, but only legally recognized. The legal provisions for, or general characteristics of, these schools are worth noting.

ARKANSAS.

The Arkansas laws contain the following provision:

> The county superintendent shall teach a normal institute from the first Monday in April to the regular quarterly examination in June. He shall confer with the State superintendent and outline a course of study to be used in the normal institutes. This course of study shall embrace the branches of study required for the first-grade certificate and shall seek to qualify teachers and prospective teachers for more efficient work in the schoolroom. Tuition for all teachers and prospective teachers shall be free. (S. L., 1910, pp. 42–43.)

This is obviously little more than a coach class for the ensuing teachers' examination.

COLORADO.

A summer normal school for the instruction of teachers and those desiring to teach shall be held annually for a period of not less than six weeks in each summer normal school district (5) of the State. (S. L., 1911.)

FLORIDA.

The Florida law provides for three—two white and one colored—six-weeks summer schools under the direction of the State superintendent. These schools are taught by instructors selected from the teachers at the State institutions of higher learning and high-school principals, and they have displaced the shorter teachers' institutes formerly held in the State. For their support the legislature appropriated $4,000 for the year 1909 and $4,000 for the year 1910.

KANSAS.

The provision of the Kansas law reads as follows:

> The county superintendents of public instruction shall hold annually, in their respective counties, for a term of not less than four weeks, a normal institute for the instruction of teachers and those desiring to teach. (S. L., 1909, p. 115.)

Two or more counties may unite in holding these "institutes." Conductors and instructors are selected by the county superintendent with the advice and consent of the State superintendent; pro-

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vided, however, that no one shall be engaged as such conductor or instructor who has not received a special certificate for the work from the State board of examiners.

To defray the expenses of said institute the county superintendent shall require the payment of a fee of one dollar from each candidate for a teachers' certificate, the payment of one dollar registration fee for each person attending the normal institute; and the board of county commissioners shall appropriate such sum as the county superintendent may deem necessary for the further support of such institutes: *Provided*, Such appropriation does not in any year exceed the sum of $100. (S. L., 1909, p. 115.)

IDAHO.

The Idaho law provides for a commission on summer normal schools, consisting of the State board of education and the principals of the two normal schools. This commission is authorized to establish three six-weeks summer schools and appoint instructors therefor, one of whom "shall be from without the State of Idaho." They are authorized to expend for these schools a sum not to exceed $1,000 per annum. As this does not meet all the expenses, an enrollment fee of $5 is charged. One of these schools, the one at Coeur d'Alene, is scheduled as the summer session of the State Normal School at Lewiston.

LOUISIANA.

The laws of Louisiana provide as follows:

There shall be established and maintained by the State institute fund, in conjunction with the Peabody Institute fund, summer normal schools in the State, with sessions not less than four weeks. (S. L., 1911, p. 41.)

Regarding the summer schools in session under this law in 1910, State Supt. T. H. Harris, in a letter to the author, says:

We hold five summer schools for white teachers. Four of these are kept open for nine weeks and one for six weeks. The work in three of these schools is so organized that teachers may prepare themselves to pass the examination leading to the different grades of certificates issued in this State and at the same time receive credits toward graduation in the institution where the summer schools are held, namely, the two industrial schools at Lafayette and Ruston and the State Normal School at Natchitoches. The other two are held at the Louisiana State University and Tulane University, and are organized to train teachers for high-school work. Teachers attending these two schools are also given credits toward degrees in the two institutions. Students completing satisfactorily the work in any one of the four 9-weeks summer schools may have their teachers' certificates extended one year, or if they hold no certificates are given 15 points on an examination for a certificate.

In former years Louisiana had a graded system of summer schools that was intended to reach specifically teachers of various stages of preparation. Those who were without experience were expected to attend one class of schools, those with second and third grade certificates another class, and those holding first-grade and higher certificates were expected to attend the session held either at the State

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University at Baton Rouge or at the Tulane University at New Orleans. In the summer of 1907, for example, three schools were open only to "beginners in teaching" and six were open to teachers holding second and third grade certificates. Teachers holding first-grade certificates were also allowed to attend the latter class of schools.

MAINE.

According to a law passed in 1901, and which is still in force, Maine appropriates $2,500 annually for at least four summer schools that are free to teachers. These schools continue in session two or three weeks and terminate in the State teachers' examinations. This explains their nature.

MINNESOTA.

Minnesota annually appropriates $30,000 for teachers' training schools, with sessions of not less than four nor more than six weeks. These schools are in charge of the State superintendent, who "shall designate the county or counties for which such * * * training school shall be held, and the time and place of holding the same, and assign instructors and lecturers therefor." (S. L., 1907, p. 109.)

Thirty-two of these schools were held in 1910, as follows: Sixteen for four weeks, 5 for five weeks, and 11 for six weeks. In addition to these schools, the Minnesota law also provides that the State normal schools shall hold summer sessions. (See below, p. 50.)

NEBRASKA.

One of the most promising types of summer training schools is held annually in Nebraska. The schools are called "junior normals" because of the relation they bear to the regular normal schools. They offer a course of study, progressive from summer to summer, identical with that leading to the elementary certificate in the normal schools, and when the course is finished the student is graduated. The certificate he receives becomes a teachers' certificate good for from one to three years. Eight of these schools, continuing in session eight weeks, are held every summer. A part of the session is designated as institute week by the superintendent of the county in which the school is held and the same privilege is granted to the superintendents of neighboring counties.

For the support of these schools the State appropriation for the biennium 1909–10 was $20,000. In addition to this sum, there was expended $10,000 derived from enrollment fees, county appropriations, and institute funds, making the eight junior normal schools cost $30,000 for the two sessions.

The following extract from the junior normal school report for 1910 throws additional light on these schools:

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JUNIOR NORMAL SCHOOLS FOR 1910.

The eight junior normal schools located at Alliance, Alma, Broken Bow, Geneva, McCook, North Platte, O'Neill, and Valentine closed their eight-weeks sessions July 29. The total number of students enrolled was 1,414, including 557 enrolled for institute. The total attendance is 20 more than the attendance for 1909.

The first week, or first two weeks, was designated as institute for the counties in which the junior normals were located, except in the case of Lincoln County, which named the last week of the North Platte junior normal as institute week. At the Alliance junior normal Grant, Hooker, and Sioux Counties united with Boxbutte County for the institute; Blaine and Thomas Counties united with Custer County at the Broken Bow junior normal; Hitchcock County with Redwillow County at the McCook junior normal; and Perkins and Keith Counties with Lincoln County at North Platte. At these four junior normals and at the Geneva junior normal special instruction was given in domestic science and agriculture, the counties uniting in bearing the greater part of the extra expense.

A number of students completed the junior normal training course at some of the schools, and appropriate graduating exercises were held. These graduates have all attended the junior normal schools not less than four sessions, and have completed the required course of study, for which credit is given at the State normal schools.

NEW JERSEY.

While no summer normal school is scheduled in Table I for New Jersey, it may be mentioned at this point that this State annually appropriates $2,000 for summer courses in elementary agriculture, manual training, and home economics. (S. L., 1908, p. 121.)

NORTH DAKOTA.

In North Dakota the county, or several counties combined, may hold a summer school of at least three weeks in place of the regular institute, and when held the teachers are obliged to attend for at least five days. These schools are supported primarily out of the institute funds of the counties that join in holding them, but when they are held in connection with the university, agricultural college, or a normal school they receive support also from the funds of these schools. The summer schools held in connection with these institutions usually continue in session six weeks instead of three.

TENNESSEE.

Tennessee conducts what are called State institutes, but which are virtually summer schools. Nine of these institutes were held in 1908, six for white teachers and three for colored. They continued in session four weeks and were held mostly in July.

In connection with Tennessee should be noted the summer school of the South, held annually at Knoxville, on the initiative of Dr. P. P. Claxton. This school offers work for teachers of all grades of preparation and draws from a wide range of territory. The attendance in 1910 was more than 2,500. (See Table II.)

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TEXAS.

The provision of the Texas law pertaining to summer normals reads as follows:

> The State superintendent shall prescribe regulations for the holding of summer normal institutes and prescribe the rules for granting summer normal and permanent certificates, which shall be State certificates. (S. L., 1909, p. 40.)

In 1910, 116 of these schools were held, 73 for white teachers and 43 for colored. The enrollments were respectively 10,567 and 2,398, a total of 12,965. The usual length of the session is six weeks, although a few continued for eight weeks.

The schools are supported almost entirely by a fee of $5 required of each student.

VERMONT.

The Vermont law provides that the State superintendent of education and the county examiner of teachers—

> may, if no institute is held in a county during any year, arrange for and conduct a summer school for teachers, the expense of which to the State shall not exceed twenty-five dollars per day for not more than ten days * * *. Said superintendent and the examiners concerned may, in their discretion, unite and hold, in some convenient location, a summer school for two or more counties; but the entire expense to the State of such school shall not exceed the expense of two schools as herein provided. (S. L., 1907, sec. 917.)

Two of these schools were held for elementary school teachers in 1910, one continuing in session two weeks and one four weeks. The attendance was, respectively, 100 and 60.

VIRGINIA.

In Virginia the older type of teachers' institutes has been displaced by a system of summer schools supported in large part by the State. The law specifies that at least eight of these schools shall be held in different parts of the State, but, in 1910, 19 were held, 12 for white teachers and 7 for colored teachers. The total enrollment was nearly 5,000, which is approximately one-half the number of teachers in the State, but it should be said that this enrollment included some teachers from outside of Virginia. The usual length of session is four weeks, but the schools held at the University of Virginia and at the Harrisonburg normal school continue six weeks.

The summer school held at the University of Virginia (see Table II) has combined with it one of the summer training schools, and therefore is similar to the school held at Knoxville, reaching teachers of various stages of preparation. But both schools also offer work of college grade that may be taken for college credit. At Virginia, local teachers may earn professional certificates, good for seven years and renewable for a like period, by passing in six college subjects taken in at least two summer sessions.

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SUMMER SESSIONS IN STATE NORMAL SCHOOLS.

Only 13 States are scheduled in Table I as having summer normal schools, but this does not necessarily mean that summer schools of this grade do not exist in the other States. Judging from the catalogues on file at the Bureau of Education, between 25 and 30 per cent of the State normal schools are in session for from 5 to 13 weeks during the summer months, but this includes schools in 26 different States.[1]

The most frequent length of session is 6 weeks, and this is found in one or more of the normal schools in at least 15 States. If the schools at Mankato and at Moorhead, Minn., and at Harrisonburg, Va., were included in this count, as they should be from one point of view, this list of States would swell to 17. These schools divide their 12-weeks summer sessions into two terms of 6 weeks each, either one of which may be taken without the other. This practice is followed also by the Illinois State Normal University at Normal.

Six-weeks summer sessions are held at Conway, Ark.; Greeley, Colo.; Willimantic and Danbury, Conn.; Lewiston (Coeur d'Alene), Idaho; Carbondale, Charleston, DeKalb, and McComb, Ill.; Terre Haute, Ind.; Cedar Falls, Iowa; Bowling Green and Richmond, Ky.; Mayville and Valley City, N. Dak.; Oxford, Ohio; Aberdeen, S. Dak.; Oshkosh, Whitewater, Stevens Point, and Superior, Wis.; and at all of the Michigan (4), Oklahoma (6), and Washington (3) State normal schools. Oklahoma apparently has schools including work of a similar grade also at the State university, the agricultural college, the two university preparatory schools, and for colored teachers at the Agricultural and Normal University.

Apparently but one normal school has a summer session of less than six weeks. This is the school at Hyannis, Mass., which has a session of five weeks. The St. Louis Teachers' College, however, also has a five-weeks summer session.

Eight-weeks sessions are held at Kearney, Peru, and Wayne, Nebr.; Plymouth, N. H.; Las Vegas and Silver City, N. Mex.; Nashville, Tenn. (Peabody Normal College); and one is announced for 1911 at Dillon, Mont. The State normal school at Harrisonburg, Va., and the schools in Missouri (5) and in Minnesota (5) continue in session throughout the year, holding four quarters of 12 weeks each, one of which falls in the summer months. The normal school at Natchitoches, La., is in session for 13 weeks during the summer. The Chicago Teachers' College, which is the advanced department of the Chicago Normal School, is open during the summer for two terms of 5 weeks each.

[1] As only 3 or 4 per cent of normal school catalogues are supplied with indexes, as only a slightly larger per cent are supplied with tables of contents, and as many do not classify or summarize their students in any way, these data may be slightly incomplete.

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The Minnesota law, as amended in 1909, provides:

That there shall be at each of the State normal schools in this State, a summer session of twelve (12) weeks each, under the direction of the State normal board. These summer sessions shall be a part of and in all respects the same as the session now provided by law. The provisions for attendance at these summer sessions shall be the same as those now in force and the arrangements of the terms in the school year shall be such as to most fully serve the welfare of rural schools: *Provided*, That said normal board may, in its discretion, * * * direct that a shorter session than twelve weeks be held at any of said schools. (Supplement, p. 5–6.)

The intent of this law is clearly to provide that the normal schools shall reach the rural-school teachers, as well as others that are engaged in teaching during the school year, but it is a difficult matter to determine the extent to which this is done. The number of students and teachers from rural districts is not indicated in the school catalogues and in most cases this information is very probably not in the possession of the enrolling officers. It may be said, however, that the announcements of the summer sessions usually indicate that special courses for rural teachers are provided.

Nearly all of these sessions in normal schools are supported in whole or in part by public appropriations, so that tuition is either free or nominal. The student is seldom called upon to pay a fee as high as $10 and the chief expense that he has is for board and room.

Private normal schools furnish summer sessions lasting from 6 to 12 weeks at Stockton, Cal.; Dakota and Dixon, Ill.; Marion and Muncie, Ind.; Perry, Iowa; Grand Rapids, Mich.; and Lebanon, Ohio.

SUMMER SCHOOLS IN COLLEGES AND UNIVERSITIES.

In discussing the agencies that work for the improvement of teachers in service, we must mention also the summer schools and summer sessions held in colleges and universities. These schools supplement those already discussed in that they reach primarily the teachers of higher institutions, normal schools, secondary schools, and special teachers, principals, supervisors and superintendents, as well as the better-prepared elementary-school teachers.

These schools, as a rule, not only offer courses in the old-line academic subjects, but they make an especial effort to supply the teachers with the knowledge that has come into vogue since they began their teaching. Nearly all of these schools offer courses in elementary agriculture, nature study, manual and industrial work, and domestic art and science. Usually this work is offered in the agricultural and mechanical departments of the colleges and universities, but the independent agricultural and mechanical colleges also offer summer courses especially for teachers. In the summer of 1910, 31 of these colleges, either on independent foundations or in connection with universities, were in session in as many different States.

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Complete data concerning summer schools held in colleges and universities are at present not being gathered in this country, but some statistics on this topic are included in the reports of the United States Commissioner of Education. The figures for the summer schools of 1908 are found in Table 68, pages 900–925, of the report for 1909. This table gives the number of instructors and students for 493 universities, colleges, and technological schools for men and for both sexes.

Of these 493 schools, 97, or 20 per cent, reported summer-school enrollments. These enrollments add up to a total of 21,700 students, 11,468 women and 10,232 men. But these figures are not complete. No summer-school students were reported, for example, by Chicago, Columbia, and Virginia Universities, all of which had well-attended summer schools in 1908. How many other schools failed to report their summer enrollments it is difficult to say.

In order to determine roughly for this study the percentage and classification of teachers attracted by university summer schools, the following blank was sent to 20 universities in various parts of the country by the Bureau of Education in August, 1910.

Summer schools, 1910.

Total number of students enrolled.....
Number of teachers enrolled.....
College teachers.....
Normal-school teachers.....
High-school teachers.....
Elementary-school teachers.....
Rural-school teachers.....
How many of these teachers are working for degrees?.....
What other credit, to your knowledge, is given these teachers for the work done, by the boards employing them, for example?.....

Replies to this blank were received from 14 schools, but one of these proved to be without a summer session. These replies are tabulated in Table II, which needs but little elucidation to be understood.

By an oversight, for which the writer is responsible, no item was included in the blank for principals, supervisors, and superintendents, and as these were usually given with the high-school teachers by the reporting officers, they have been so tabulated. A few elementary-school principals, however, are included with the elementary-school teachers.

A few of the schools gave the principals, supervisors, and superintendents separately and from these data it may be calculated that approximately one-half the figures in the high-school columns stand for these classes of officers.

The table indicates that on the average over 50 per cent of the summer-school enrollment is composed of teachers, and, as one of the

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directors expressed it, "more than two-thirds of the others are preparing to teach." This indicates the strength of the summer school as an agency for the improvement of teachers.

TABLE II.—*University summer schools, 1910.*

School.	Students enrolled.	Teachers enrolled.	Per cent.	College teachers.	Per cent of teachers.	Normal.	Per cent.	High-school principals and superintendents.	Per cent.	Elementary.	Per cent.	Rural.	Per cent.	Per cent working for degrees.
Columbia	2,629	1,691	64	140	8.0	85	5.0	742	44	724	43	....	....	44
Chicago	....	2,291	....	300	13.0	....	....	....	....	....	....	....	....	....
Cornell	987	377	38	26	7.0	15	4.0	199	53	134	35	....	....	28
Illinois	691	322	46	10	3.0	4	1.0	164	50	118	37	26	8	....
Knoxville	2,529	1,500	59	....	....	....	....	....	....	....	....	....	....	....
Michigan	1,230	283	23	66	23.0	9	3.0	126	44	82	29	....	....	....
Missouri	576	261	45	5	2.0	3	1.0	152	58	80	31	21	8	70
Nebraska	440	100	23	10	10.0	2	2.0	46	46	30	30	12	12	69
New York	529	349	66	12	3.5	16	4.5	133	38	188	54	....	....	57
Texas	762	587	77	7	1.2	130	22.0	200	34	100	17	150	26	25
Tulane	922	483	52	....	....	2	.5	50	10	431	89	....	....	75
Virginia	1,350	943	70	11	1.0	....	....	197	21	[1] 696	74	[1] 700	74	....
Wisconsin	1,263	630	50	99	15.5	12	2.0	350	55	179	28	....	....	90
Totals and averages [2]	10,029	5,083	51	375	7.2	278	5.5	2,162	42	2,066	41	209	4	57

[1] Not mutually exclusive. [2] Without Chicago, Knoxville, and Virginia.

The other percentages are about what one would expect. College and normal-school teachers frequent university summer schools in about equal numbers, and the attendance of high-school teachers, principals, supervisors, and superintendents combined is about equal to that of city elementary-school teachers. With the exception of Knoxville and the University of Virginia, whose summer schools have already been discussed (pp. 47 and 48), these schools do not reach rural-school teachers to any great extent.

The number of summer-school students working for degrees is not always known to the directors, and some of the figures in this column are approximations. The few exact figures available, however, would indicate that these approximations are none too high. An average of 57 per cent working for degrees is certainly a good showing in this direction. It indicates that one of the chief missions of the summer school is to furnish opportunities for standard educational work. The academic credit is, and should be, one of the chief motives for bringing many students to the school. Students should certainly be permitted to earn the bachelor's and the master's degrees, and, perhaps, to do something toward the doctor's degree.

The usual length of the session is six weeks, which seems to have become the standard length for all types of summer schools. It is long enough to accomplish something worth while, yet it is not long enough greatly to tire the students and teachers. Nevertheless, if the summer session is to furnish an opportunity for earning standard

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educational credits it could well afford to be longer than six weeks. Five exercises a week for six weeks gives but 30 exercises in all, which is less than one exercise a week throughout the academic year. This is too short a time to cover any of the college subjects even in an elementary way, and to divide the subjects between summers has not proved satisfactory where it has been tried. Eight or nine weeks would furnish a more adequate amount of time for real college work, and the plan of dividing the college year into four quarters and placing one of these in the summer, as is done by Chicago University, may ultimately prove the best. Recreation and amusement, which are now so generally provided for in the six-weeks' session, could be provided for here also. In fact, there is no good reason why more of these activities might not be distributed throughout the college year. They can be made genuinely educative as well as recreative.

Little of a definite nature was elicited by the question pertaining to the granting of credit other than academic. It was brought out that a number of cities, for example, Indianapolis, Niagara Falls, New York, and Pittsburg, place a high value on the attendance by their teachers and that they recognize this attendance by means of promotions, salary increases, and otherwise.

EXTENSION TEACHING.[1]

Under the head of extension teaching will be considered (1) lyceum and extension lectures, (2) extension and after-hour classes, and (3) correspondence study.

LYCEUM AND EXTENSION LECTURES.

To lyceum and extension lectures will be given but little space, because they are of too general a nature to exert much influence on the improvement of teachers in service. They are not meant specifically for teachers, as a rule, and reach them only in conjunction with other members of society.

There is scarcely a city of 3,000 and over in the United States that does not arrange for some kind of a lecture and entertainment course for the winter months. The teachers frequently take a leading part in arranging these courses and they attend them in a greater proportion than any other one class of citizens. Nor is the profit that they derive from them to be disparaged. Many of the lectures are distinctly of an intellectual or educational value, and all the numbers possess inspirational or recreative values. The social intercourse that always results is one of their most delightful features.

[1] For a brief survey of the history and present status of university extension, the reader is referred to a paper by that title presented in behalf of the University of Wisconsin by Prof. Louis E. Reber at the eleventh annual conference of the Association of American Universities and printed in "Science" for July 22, 1910. Some of the data used in this section have been taken from that paper.

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The Chautauqua lectures given in many places during the summer months are in many respects similar to these lyceum lectures.

A class of lectures that is on a higher plane educationally than lyceum lectures is the class of university extension lectures. These lectures were in their height of popularity in this country in the nineties, but they are still widely patronized. They are usually arranged for in courses of six lectures on one subject, all given by the same person. Opportunity for collateral reading is given and by satisfying certain conditions a student may in some places earn college credit.

Prof. Reber sent out inquiries to 75 universities, colleges, and other agencies for extension teaching. Responses were received from 65 institutions, and, of these, 54 were doing extension work of some kind. At least 22 of the universities included in this list were offering opportunities to earn college credit by means of extension work. Eleven of these included correspondence study as one of the means of earning this credit.

Of 32 State universities that reported, 23 were offering general extension work. Of these, 15 had thoroughly organized and comprehensive extension departments under the permanent direction of a dean, director, or extension committee.

The school that Prof. Reber found to take the leading part in extension teaching by means of lectures, accompanied by classes, written papers, and examinations is the University of Chicago. The work of this school in 1907–8 extended into 28 States, and the total attendance at the lectures reached 53,141 persons, an average of 282 per lecture. The average class attendance was 150. Owing to the loss of four popular lecturers from this field, the attendance in 1908–9 dropped to 31,094.

Of especial interest are the following words of Prof. Reber:

> It is noticeable that a number of State institutions are making use of extension methods chiefly as an aid to the teachers of the State. This limited field probably results from three causes: First, the evident need of some agency to assist the busy teacher to keep in touch with educational advances; second, the fact that this is the path of least resistance, extension work among teachers offering no difficult problems; and, third, on account of the organic relations between the teacher and the State university, which are evidently becoming more closely knit, in spite of the high-school protest against university domination.

EXTENSION AND AFTER-HOUR CLASSES.

Extension classes and after-hour classes should probably be treated separately, although it is not always easy to distinguish between them. By after-hour classes are meant those intra-mural classes that are placed in the late afternoon, in the evening, or on Saturday when teachers in service and other workers can attend them. The conditions of admission to these classes are the same as those to all other regular university classes.

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Extension classes are usually, although not always, extra-mural, and as a rule the only condition for admission to them is that the instructor be satisfied that the student can take the work to advantage. If, however, the student desires to earn college credit, he must satisfy all the conditions that a regular college student is obliged to satisfy. These are primarily the meeting of the entrance requirements and the preparation of papers and the passing of examinations in connection with the class work.

After-hour classes are offered by practically all colleges and universities and by some normal schools located in centers of population large enough to furnish an adequate number of students. Such classes are offered, for example, by the universities of Chicago, Cincinnati, Columbia, Brown, George Washington, Harvard, Indiana, Johns Hopkins, Nebraska, New York, Northwestern, Pennsylvania, Pittsburg, Tulane, Vermont, and Washington (St. Louis), as well as by the College of the City of New York and by Butler College, of Indianapolis, Ind.

These classes furnish opportunities for many teachers in service to broaden their equipment for efficient work and to earn degrees without loss of salary. School officers as a rule place a high value upon this work, and in some places they reward their teachers by special promotions and increases in salary; or, put in another way, work of this kind is necessary for, or is one means of gaining, certain promotions and salary increases. (See pp. 116 et seq.)

Extension classes, many of them primarily for teachers, are offered by a number of the colleges and universities just mentioned, and also by the following: University of Missouri, University of Minnesota, and Western Reserve University.

The opportunities offered by extension classes are similar to those offered by after-hour classes, except that extension classes often reach students many miles removed from the college walls. But what was said in regard to after-hour classes also applies here with but slight modifications.

A more concrete idea of the nature and extent of extension classes may be obtained from the following extracts from the bulletin on extension teaching issued by Columbia University for 1910–11:

NATURE AND EXTENT OF EXTENSION CLASSES.

The statutes of the university define extension teaching as "instruction given by university officers and under the administrative supervision and control of the university, either away from the university buildings or at the university, for the benefit of students unable to attend the regular courses of instruction."

STUDENTS.

Courses in extension teaching are planned for two classes of students: First, men and women who can give only a portion of their time to study and who desire to pursue

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subjects included in a liberal education of the character and grade of a college or professional school, but without any reference to an academic degree; second, those who look forward to qualifying themselves to obtain in the future academic recognition, involving acceptance of the work which they may satisfactorily complete in extension teaching.

COURSES OF INSTRUCTION.

The administrative board of extension teaching has arranged for the academic year 1910–11 regular courses of instruction in many instances coordinated so as to form the first year of collegiate and professional work. Thus there will be given in the evening at Morningside Heights and at 33 East Park Street, Newark, N. J., courses in subjects which are offered in the freshman year of Columbia College and Barnard College.

(At Morningside Heights and at Newark, N. J., evening colleges are maintained for extension work. At Brooklyn courses arranged in a series of three years are regularly given.)

There will also be offered at Morningside Heights, in the evening, subjects which form the first year of the schools of mines, engineering, and chemistry.

At a location to be announced about September 1, probably adjacent to Fourth Avenue and Twenty-third Street, evening courses will be offered in architecture which will correspond to the courses of the first year of the Columbia University School of Architecture.

A large number of other courses in varied subjects will be given late in the afternoon and on Saturday, which will repeat those in liberal studies offered in the colleges of the university. These are given in the same manner and often by the same instructors as the regular courses. In many instances university credit will be granted.

Numerous courses will be given at various centers. These will be either regular courses of collegiate grade or those preliminary thereto, or lecture courses arranged in groups of six lectures, offered weekly or fortnightly.

Lecture-study courses in certain subjects, forming 30 lectures, alternating with quiz or conference hours, will be given at Morningside Heights and at centers when requested.

FEES FOR EXTENSION COURSES.

All students, matriculated or nonmatriculated, admitted to extension courses must pay the fees determined by the administrative board * * * As a rule, the fee for extension courses is determined at the rate of $5 per point, i. e., for one hour per week of classroom work or two hours of laboratory or drawing-room work through a term. * * * Students who enter extension courses as matriculated students must pay a matriculation fee of $5.

ADMISSION TO EXTENSION COURSES.

No test or examination is required for admission to courses offered in extension teaching, but students must satisfy the administrative board that they can pursue the courses with advantage. It is expected that the prospective student in all collegiate and professional courses shall have had a full secondary-school education. The courses are open, unless it is otherwise stated, both to men and women.

REGULATIONS GOVERNING CREDIT TOWARD THE DEGREES OF A. B. AND B. S., COLUMBIA COLLEGE, BARNARD COLLEGE, AND TEACHERS COLLEGE.

Students of Columbia College and Barnard College will be allowed to attend extension courses which are approved by the committees on instruction, and will be allowed to count them toward the degree of A. B. and B. S., under the following regulations:

1. The election of extension courses must be approved by the committees on instruction.

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2. Students will not be allowed to exceed a total of 19 hours per week (16 hours in Barnard College) including the hours of extension courses, save for reasons of weight and by the special permission of the committees on instruction.

3. Students desiring these courses to count toward the degrees of A. B. and B. S. must obtain at least a grade of C.

Teachers College will continue to give, as hitherto, college credit for extension courses.

EXTENSION WORK IN NORMAL SCHOOLS.

Extension teaching has made conspicuously less progress in normal schools than it has in colleges. This is no doubt owing to a number of causes, chief among which is the fact that normal schools exist primarily for the training of teachers, a task that can not well be accomplished away from their own plants and equipment. Only academic and art work lend themselves readily to extension classes.

Extension work is advertised in the catalogues of the following six schools: The Chicago Normal School; the Teachers College, St. Louis; the Michigan State Normal College, Ypsilanti; the State Normal School at Springfield, Mo.; the State Normal School at Warrensburg, Mo.; and the Ohio State Normal College of Miami University, at Oxford, Ohio.

The extension work advertised by the State Normal School at Warrensburg, Mo., is of a general nature, consisting of lectures given at "teachers' institutes, farmers' meetings, commencement exercises, and college and university convocations." Lectures of this kind are given by members of practically every normal-school faculty in this country.

The St. Louis Teachers College gives extension courses for the benefit of teachers in both academic and professional subjects. The classes meet once a week and continue for 20 weeks. No teacher is allowed to enroll for more than two courses in any one year. A certificate is awarded for the successful completion of a course.

The work of the other schools is best illustrated by quotations from the catalogues.

CHICAGO NORMAL SCHOOL.

Study classes in the academic subjects—education, psychology, English, French, German, Spanish, history and social science, geography, mathematics, science, history of arts—are organized on the basis of 24 lessons of one and one-half hours each; classes in the arts—graphic, manual, industrial, and household—and in music and physical education are organized on the basis of 36 lessons of one and one-half hours each.

Classes will meet at centers in the business section of the city, or in public-school buildings conveniently located [16 centers are announced in the catalogue], at 4 o'clock p. m. on any school day except Monday, or in the evening at any school building open for evening school. (Catalogue, 1909–10.[1])

[1] District Superintendent C. D. Lowry in a letter to the writer says: "The Normal extension classes for teachers, which are provided by the board of education, are at present pretty largely limited to the summer school conducted at the Chicago Normal School during the entire vacation season."

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MICHIGAN STATE NORMAL COLLEGE.

The State Normal College hopes in the future to be helpful in developing and improving the educational work in city, village, and rural communities, by allowing its faculty members to give single lectures or courses of lectures at educational and social meetings. * * * The only charge made for these lectures will be necessary railroad and hotel expenses. (Catalogue, 1909–10, p. 35.)

STATE NORMAL SCHOOL, SPRINGFIELD, MO.

The faculty has done much work outside the school during the past year. Extension classes were maintained in seven places, conducted by as many members of the faculty from the departments of pedagogy, English and history. * * * Any class of 10 in one subject may be organized within easy reach of Springfield. The amount of work for an entire year will be two term credits. All the extension classes must enroll and pay the usual fees. (Catalogue, 1909, p. 20.)

OHIO STATE NORMAL COLLEGE.

The Ohio State Normal College advertises extension work in two lines: (1) Visits from department professors, and (2) lantern slides and laboratory material.

(1) Upon application the normal college will send a department professor who will visit the schools and advise with the teachers as to the best methods of conducting the work in his special subject, suggesting equipment and laboratory exercises, conduct round-table conferences with groups of teachers, and deliver lectures to teachers, pupils, and patrons.

(2) The normal college is prepared to loan to schools sets of lantern slides upon school improvement, geography, nature study, travel, etc., also to furnish specimens for nature study and relative seeds, cocoons, rocks, etc. (Catalogue 1909–10, p. 14.)

CORRESPONDENCE STUDY.

Correspondence study is rapidly becoming a force to be reckoned with in the educational world. Where but a few years ago this work was left almost entirely to private commercial exploitation, it is now being rapidly adopted by our standard universities, colleges, and normal schools. As late as 1904 Dexter[1] could say: "In but one of the great higher institutions of learning (the University of Chicago) are correspondence courses now emphasized," but in 1910 the work was offered also by 10 State universities—Florida, Indiana, Kansas, Maine, Minnesota, Nebraska, Oregon, Texas, Wisconsin, and Wyoming—as well as by the Pennsylvania State College and the Massachusetts Agricultural College, and by the normal schools at Athens, Ga., Danbury and Willimantic, Conn., Normal, Ill., Silver City, N. Mex., and a course in shorthand by the North Carolina Normal and Industrial College, Greensboro, N. C.

[1] History of Education in the United States, p. 547. Anyone interested in the history of correspondence schools is referred to this volume, pp. 545–549. For a more extended history, he is referred to the Report of the Commissioner of Education, 1902, Vol. I, pp. 1069–1094.

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CORRESPONDENCE STUDY IN COLLEGES AND UNIVERSITIES.

The work done by correspondence in colleges and universities is outlined in Table III. It is clear from this table that the present movement in establishing the work dates from 1906 and is only now getting under way. The number of students enrolled in the different schools varies greatly, but as some of the departments are barely started, the figures given carry little significance. Wisconsin and Chicago take an undisputed lead. each having about 3,000 students registered doing active work.

The grade of work offered ranges from that of the high school, and even lower, to that of the graduate school. The wants of all classes of people are met and much of the work is intended to satisfy no other motive than the benefit derived from the work itself. Not a little of the general work is planned to enable teachers to pass examinations for certificates and the secondary-school work may usually be taken for the satisfaction of entrance requirements.

The work in agriculture and kindred subjects offers splendid opportunities for teachers who are required to give instruction in nature study and elementary agriculture but who have received no specific preparation therefor. To meet this need, some of the courses offered in agriculture are planned especially for teachers.

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TABLE III.—*Correspondence study.*

School.	Year organized.	Enrollment, 1909-10.	Work offered.	Credit.	Fees.	Remarks.
University of Chicago	1892	About 3,000	General; college entrance.	One-half college course	1 major, $16; 2 majors, $30; 3 majors, $40; minors, $8.	
University of Florida	1906	576	Agriculture	Apparently no college credit.	Free except postage and texts.	Offers courses especially adapted to teachers in service.
University of Indiana	1908	125	English, history, political science.	Up to 15 hours in each department.	$5 for 20 weekly lessons.	
University of Kansas	1909	50	General college	One-half college course	Regular fees, $5; matriculation (once), incidental (annual), $10; laboratory fee, $5.	Fees double for nonresidents; traveling libraries furnished.
University of Maine	1906	131	Agriculture, home economics.	Certificate given, no college credit.	Free	
Massachusetts Agricultural College.	1909	106	Agriculture	No college credit	$1 a course	
University of Minnesota.	1909	50 (education), 27 (economics).	Education, economics, and political science.	College credit allowed; credit toward teachers' certificates.	$10 for 24 assignments	
University of Nebraska.	1908	219	General college: For teachers' certificates.	One-half college course	For teachers: $5 for 1 semester; $8 for 2 semesters; $12 for 3 semesters.	Attendance at summer sessions counts as residence.
University of Oregon	1907	389	General college entrance.	College credit allowed, amount not yet determined.	Free except postage	One-fourth year residence required for master's degree.
Pennsylvania State College.			Agriculture	College certificate granted	Free	Courses intended for teachers among others.
University of Texas	1909	334	General; for teachers' certificates.	One-half college course	$21 for full course; $7 for one-third course; (20 full courses for B. A.).	
University of Wisconsin.	Reestablished 1907.	4,400 registered; 3,000 active.	General	do	$20 for course of 40 lessons	
University of Wyoming.			do	do	$8 per course	

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Ten of the thirteen institutions listed allow college credit for the work taken by correspondence. When a sufficient variety of courses is offered, one-half of the college course may be so taken. This is evidently becoming the standard amount that may be counted toward a degree.

The fees charged vary greatly, but for valid comparisons the amounts given in the table must always be correlated with the extent of the course. In five of the institutions listed the work is approximately free. For details the reader is referred to the respective catalogues and bulletins.

The manner in which the work is conducted does not vary greatly in the different institutions and may be illustrated by the following extracts from the catalogue of the University of Wisconsin for 1910–11, pp. 443–449:

SCOPE OF UNIVERSITY CORRESPONDENCE WORK.

PURPOSE.

There exists in every community a considerable class of persons who are unable to adjust themselves to the formal system of education. Such persons have a claim upon the State for educational opportunities outside the formal régime. The correspondence-study department serves the needs of men and women in this situation and offers effective individual instruction, which may be pursued in accordance with the requirements of each student in his own home.

TEACHING BY MAIL.

The possibility of teaching by correspondence has been demonstrated by practical experiment. While such instruction lacks some of the advantages which resident study gives, it has compensating advantages of its own. In correspondence instruction the teaching is personal and individual. Every student studies and recites the whole lesson, comes in contact with the teacher as an individual, not as a member of a large class. Correspondence study employs the spare time of the student, and gives him an interest beside his daily work. It can be done at home and thereby brings into the home a new and enlarging influence. Correspondence work, moreover, throws a man upon his own resources and makes him self-reliant and self-determining.

PLAN AND SCOPE.

The University of Wisconsin provides, through the correspondence-study department, nonresident or home-study instruction as follows:

1. Certain regular university studies which may, under approved conditions, be taken for credit toward a degree.
2. Advanced courses designed to help persons, graduates and others, in professional or practical life to keep in touch with certain advancing conditions of science and knowledge.
3. High-school and preparatory studies for those for whom the conventional institutions are not available or practicable.
4. Vocational courses which supply knowledge and training that have a direct bearing upon advancement and efficiency in a given occupation.
5. Elementary and grammar-school studies for those who require such instruction for practical purposes.

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General benefits.—Persons who are benefited by correspondence study may be divided into two main classes: First, those who have the taste, ability, and inclination to continue their education along such lines as will enrich their lives with a deeper culture, or enhance their opportunities or abilities within their chosen vocations or professions, or fit them for larger positions and services; second, that great class of wage earners who can not leave their employment to acquire training directed toward the greater proficiency and skill so greatly to be desired.

The recognized need for more widespread training for people whose work demands that some form of education be provided for their benefit equivalent to that which may be gained in the schools and universities. To this end it is necessary not only to carry the educational opportunity to them wherever they may be, but frequently to arouse and stimulate their interest by demonstrating to them the value of increased fitness. Realizing the importance of such work for the future well-being of the people and for the prosperity of the country, as well as for the maintenance of democratic institutions, the extension division proposes to establish district centers through which the entire population of the State will be reached by university benefits.

Industrial education.—The employees of business firms may be greatly benefited by training especially adapted to their work. Where a number of them are engaged in the same or similar studies, classes are formed and met by teachers at frequent intervals.

The instructor engaged in this work gives his entire time to it. He is as familiar with the employee's labor as he is with the lesson text and therefore can help the men to make practical applications of lesson to work.

Laboratory work.—Provision is made in connection with many correspondence courses, both in the advanced grade and the vocational studies, by which laboratory practice forms a part of the instruction. In some courses laboratory outfits are sent to the student from the university to be set up in his own home. In other cases special arrangements are made for short periods of laboratory practice at Madison. In some studies local branch laboratories will be established where local students may receive special instruction as the correspondence course proceeds.

METHOD AND SYSTEM.

Procedure.—The student who wishes to undertake correspondence study should first select such course or courses as he may desire to take, and send for application blank. He should fill out the blank with information called for, and return it with required fee to the office of the extension division. The necessary textbooks, outfit, etc., may also be purchased through the extension division if the student so desires.

The instruction.—Upon receipt of application fee, the first two lessons will be sent, with instructions for study, and methods of preparation, and directions for returning lesson sheets and reports. Each lesson will be returned to the student with such corrections, explanations, and suggestions as may be needed. Lists of books, assignments for reading, and all necessary assistance will be furnished throughout the course, so that no student will be left without adequate aid and guidance. Questions on the subject in hand are at all times encouraged.

The unit course.—The unit course is divided, where practicable, into forty weekly assignments. Such a course represents at least an amount of work equal to that done in residence at the university in a full five-recitation-hour study per week for one semester or half year.

The lesson.—The unit course is divided into assignments. In some courses this assignment may call for but a single lesson report, but in other courses the assignment is divided into four, five, or more lessons. In all cases the assignment represents an average week's work and not an evening's work, as at school.

Examinations.—Examinations are optional with the student, but are required where credits or certificates are sought. These examinations must be taken at the university, or under conditions approved by the university.

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Regulations.—Students may begin correspondence courses at any time during the year.

For admission to the correspondence-study department no preliminary examination is required. The student is required to fill out an application blank, giving such information as may be helpful in adapting the instruction to the personal needs of each student.

Students who undertake correspondence-study work for university credit must state this fact in advance and comply with all the requirements of the university.

Correspondence students will be expected to complete a unit course within twelve months, two courses within fifteen months, three courses within eighteen months from date of registration.

UNIVERSITY CREDIT.

Persons who have had the required preparation for admission to the university will upon satisfactory completion of a correspondence-study course designed for credit, be awarded a certificate of credit in the university.

The maximum credit granted for work done by correspondence study, however, may not exceed one-half the unit hours required for graduation.

At the completion of each correspondence-study course for university credit the student shall pass an examination held under the direction of the instructor giving such course or by some one designated by the university for that purpose.

Credit records of correspondence-study work are filed in the university extension office until the student has satisfactorily completed one year of study in residence. When all the requirements are satisfied, the correspondence-study records may be transferred to the registrar's office and applied toward graduation.

All courses offered by the correspondence-study department, whether taken for university credit or not, are on a uniform basis in reference to the amount of work covered. Courses which are satisfactorily completed have, therefore, a definite value, and all students who successfully complete such courses will be awarded certificates of the grade in which the work is taken.

CORRESPONDENCE STUDY IN NORMAL SCHOOLS.

The lead in offering correspondence work in normal schools has apparently been taken by the State Normal Training School at Willimantic, Conn. The work was organized in this school in 1902, and during the past year 76 students registered for it. No fees of any sort are charged, and approximately one year of work may be taken by correspondence, leaving one year for residence study before the diploma is granted.

Courses similar to those at Willimantic are offered also at Danbury, Conn., and 78 students were registered for this work during the past year.

The New Mexico Normal School, at Silver City, N. Mex., offers correspondence work in all courses and allows regular credit. Twenty-seven students were enrolled in 1909–10.

The correspondence work at the State Normal School, Athens, Ga., was established in 1908. General courses are offered and normal credit is allowed the student if he later enters the school for residence study.

The Illinois State Normal University, at Normal, Ill., offers two courses in geography by correspondence. The assignments for an

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entire course are sent at one time. This is likely to overwhelm the student, for one of the great psychological advantages that correspondence study has over private study is that specific individual lessons are assigned. It seems easy to advance by definite short steps, even if the course as a whole is long, but to have the whole course thrust upon one at once makes it seem discouragingly difficult. We like to see frequently what we have accomplished and to have the tasks recognized by others. Furthermore, one lesson a week, for example, is likely to be met and mastered before the next one arrives, but a large number of lessons to be mastered in a long period possesses no such compelling force over the student. The work is likely to be put off and put off until finally the student will make an attempt to bolt it all at once.

PRIVATE CORRESPONDENCE SCHOOLS.

In order to determine the extent to which private correspondence schools reach teachers in service a questionnaire was sent to 14 of these schools, requesting in particular the number of teachers—rural, elementary, secondary, normal, and college—that had been enrolled for work during the past year, and the average amount of work taken by each. Only five of these schools responded, and only three of these were in position to give any data. One had gone out of existence and the other was changing its location. No definite information can be given as to the other schools.

The schools that gave data were the American School of Correspondence, Chicago; the International Correspondence Schools, Scranton, Pa.; and the Home Correspondence School, Springfield, Mass. The letters sent by all these schools state that their records are not so kept as to enable them to give the information asked without a great deal of trouble and expense. They number their students one after another as they enroll, regardless of the kind of work taken by them.

The American Correspondence School estimated that it had "somewhere in the neighborhood of from 275 to 300" teachers doing work last year.

The International Correspondence Schools did not undertake to estimate the number of teachers doing work in the various courses offered, but said:

> We are selling over 100,000 scholarships a year and since the establishment of the schools we have sold over 1,300,000 scholarships.

The Home Correspondence School estimated that it had 1,500 teachers enrolled in the different courses, distributed approximately as follows: College, 150; normal, 200; high school, 250; elementary, 350; rural, 550.

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The amount of work taken by each teacher none of the schools which answered the inquiry undertook to state, the Home Correspondence School saying:

> It is impossible to estimate with any accuracy the amount of work taken by each on the average, for many keep up their correspondence work with us year after year.

LOCAL TEACHERS' MEETINGS.

FOR RURAL DISTRICTS.

City superintendents realize that the welfare of their schools demands periodic meetings with the teachers. The school system of a city is in all essential respects a unity and in order to maintain this unity frequent meetings of teachers and supervisors are necessary. Being necessary, these meetings are everywhere recognized as an essential element of the school system and attendance upon them is either expected or required.

While it may be granted that the school system of a county or township forms a more loosely constructed unity than that of a city, it nevertheless does form a unity. The county or township is the local unit of rural-school administration, just as the city is the local unit for city-school administration; and if teachers' meetings are necessary in one of these units they may be considered necessary also in the other.

FUNCTIONS OF TEACHERS' MEETINGS.

Teachers' meetings in rural, no less than in urban, communities are needed for a number of professional purposes. They are needed (1) for discussing and deciding upon a uniform educational policy for the district concerned; (2) for supervisory and administrative purposes; (3) as a clearing house for all general professional activities carried on between meetings, such as the reading-circle work and the outcome of the introduction of new subjects and new methods; and (4) for arousing and inspiring the teachers, for keeping them abreast, and for the purpose of stimulating educational revivals among patrons of the school.

Not only the first, but all these purposes should be looked upon as mutual, concerning both the teachers and the supervising officers. The county superintendent should, of course, be the presiding officer at these meetings, but if he values the spirit of democracy he will be a leader rather than a dictator. He will make official provision for obtaining full consideration by the teachers of all questions and policies within his jurisdiction. In coordinating the school work of the county and in harmonizing it with modern ideals and with the policies promulgated by the State education department the superintendent and teachers may well work together.

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The use of teachers' meetings for supervisory and administrative purposes is well recognized. In making his rounds over the county, the superintendent sees many things that he can improve more effectively through open discussion than private conference. The pointed discussion of a mistake common to a number of teachers is likely to prove beneficial to all. Then there are a few subjects, such as neatness in attire, that can not well be approached in private conference, but that should nevertheless be touched. The teachers' meeting forms the most effective avenue for their solution. On the administrative side the teachers' meeting offers the best means for putting in force all adopted policies, including those adopted by the teachers themselves.

The clearing-house feature of the teachers' meeting is in a measure implied in what has already been said. Whenever teachers exchange views and profit by each other's experiences, this feature is realized. But the relation of the reading-circle work and of other professional reading to the teachers' meeting deserves special mention. In South Dakota the law provides that approximately one-third of the time of these meetings should be given to the reading-circle work, and in Indiana, Louisiana, Virginia, and other States this work is done in connection with these meetings.

The introduction of new subjects and of new methods and devices is always likely to be assisted by the comparison of notes among the teachers concerned. What may have proved an insurmountable obstacle to one, may have been effectively solved by another, and the teachers' meeting brings them together. Teachers that are particularly successful in teaching certain subjects, whether new or old, should be given an opportunity to describe or to demonstrate their work for the benefit of all.

The inspirational value of teachers' institutes has long received appreciative recognition and eloquent expression. Teachers, like others, need periodic revivals. They lose sight of the larger aims and values of life and education in the routine of their daily work, and as a result they become stale, uninteresting, and discouraged. They need to be encouraged, to be given new points of view, and to be reminded of the old ones that they are always in danger of forgetting.

If teachers' institutes are to give way to summer schools, to teachers' meetings, and to teachers' associations, this inspirational function will fall primarily, although not solely, upon the teachers' meeting. In preparing programs the officials should make definite provision for inspiring lectures and for the presentation of new principles and points of view in education.

Teaching is a growing calling, and unless the teacher is continually growing with it he will soon lag behind and be classed among the old

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and inefficient. But the entire plan and function of the teachers' meeting tends to avoid just this catastrophe. The inspirational work is inspiring largely through the new and more comprehensive educational principles that are presented, the reading-circle work is a continual forging ahead in educational literature, and in the remaining time of the meeting the practical bearing of all that is new is considered.

But the professional values are not the only ones possessed by the teachers' meeting. This meeting is valuable also as a means of social intercourse among the teachers and as a means of bringing together the schools and the public. Teachers need to intermingle, both because of the recreative power of social intercourse itself and because of the esprit de corps that it engenders. Much has been made of these values as pertaining to the teachers' institute, and we shall recur to them in connection with teachers' associations. They accrue in a measure from every gathering of teachers.

The public, or the educational revival, value of teachers' institutes has also been frequently commented upon. Horace Mann feared that this value would be largely lost when institutes displaced teachers' conventions and associations, but as institutes are usually conducted they often attract more visitors than teachers.[1]

The interest that the public manifests in the teachers and their work is beneficial to both sides. It engenders a mutual understanding, which results in mutual sympathy and support. The public learns to appreciate the ideals, the problems, and the trials of the teachers' work, and the teachers are cheered and helped by the resulting attitude. It is clear, therefore, that the interest of the public in the school should be studiously maintained.

There is no more cause for fear that the teachers' meeting will fail to hold the interest of the public than the institute would. In fact, the teachers' meeting is in some respects better adapted to reach the public than the institute. The patrons of the school are interested more in their particular school than in education in general, and as the teachers' meeting deals primarily (although not solely) with local problems, rather than with education in general, it should not be hard to bring the patrons to some of the meetings.

Features especially adapted to public interest may be placed upon the programs of teachers' meetings no less than upon the programs of institutes. This holds particularly for the preliminary meeting near the opening of the schools in the fall, but patrons' days or patrons' sessions may occasionally be introduced during the year. For a concrete illustration of this see the program on page 71 below, quoted from the Indiana manual on township institutes, which are local teachers' meetings.

[1] During the season of 1907, for example, the institutes in New Hampshire were attended by 2,100 teachers and 2,500 visitors, and those in Louisiana by 1,368 teachers and 5,562 visitors.

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FREQUENCY AND LENGTH OF MEETINGS.

General teachers' meetings in cities are usually held monthly. The frequency of such meetings for rural districts has not yet been determined by custom, but it will no doubt always vary with the size of the district and the density of the population. In large, sparsely settled districts the meetings would naturally be less frequent than in small, densely populated districts. The frequency of the meetings actually held varies from two or three a year to one or two a month during the time that the schools are in session. In order not to make the meetings needlessly burdensome, one a month would no doubt be often enough, even in small districts, and one in two months in large districts.

The usual length of the meetings that are held is one day, with either one or two sessions.

For obvious reasons the first meeting of the year should, if possible, be held just before the schools open in the fall. This is the time to formulate general plans for the work of the year, and as the teachers have been doing other things than teaching for several months they need to be put into the proper mood for their work. For these reasons the first meeting might very properly be longer than the others, lasting perhaps two or even three days, and for the inspirational work special lecturers might be engaged. These characteristics are akin to those of the old teachers' institute, but the nature of the work should in the main not be the same. It should be more specifically directed toward local needs and the general training feature should be essentially omitted.

LEGAL STATUS OF RURAL TEACHERS' MEETINGS.

So much for the theory, but how about the facts? Are meetings of the nature just described held for rural teachers, and if they are, what are the lines of work pursued in them? These questions are answered in an authoritative way by the following excerpts from State laws and from official programs. Not all the States, as yet, make legal provision for these meetings, but California, Indiana, Kentucky, Louisiana, Minnesota, North Dakota, Oregon, South Dakota, Utah, Virginia, and West Virginia do (see Table I), and the brief institute meetings described on pages 8 and 9 above, which are held in Connecticut, Massachusetts, New Hampshire, Rhode Island, and Vermont, should from some points of view also be classed here. While brief enough, the work done at these meetings is, in the main, however, too general to class them as local teachers' meetings.

In a number of States, too, the teachers' institutes are being transformed into local teachers' meetings. This is well illustrated in Wisconsin, according to the letter from State Supt. C. P. Cary, quoted

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on page 43. The Nebraska law states that teachers' institutes should be held "for the purpose of comparing notes, planning and outlining the work of the current or coming school year, and to study methods of school work and the science and art of teaching" (S. L., 1909, p. 80). This is obviously the purpose of the local teachers' meeting.

CALIFORNIA.

The California law passed in March, 1911, contains the following provision:

In lieu of the institute of from 3 to 5 consecutive days * * * the superintendent of any county in which there are 20 or more school districts, or of any city and county, or of any city school district governed by a city board of education and employing 70 or more teachers, may hold during the school year, at places in the county, or city and county, or city school district, chosen by the superintendent for their convenience and accessibility to teachers and patrons of neighboring schools, 3 or more series of local day or evening institutes which shall provide, at each of the chosen places, not less than 10 hours of institute work: *Provided*, That in cities and counties one or more local day or evening institutes of not less than 2 hours each may be held on not less than 3 different dates during the year.

INDIANA.

Indiana has two kinds of local teachers' meetings in addition to the regular county institutes, one of which is in charge of the county superintendent and the other of the township trustee. In practice these two kinds of meetings are combined, the meeting in charge of the county superintendent being merely the first of a series of meetings for the year. The legal provisions are as follows:

He (the county superintendent) shall hold one preliminary institute in each township in his county before the schools for that year open, for the purpose of helping the teachers in the organization of their schools and giving any other needed assistance; but instead of holding such preliminary institutes in each township, he may hold a joint institute for two or more adjoining school corporations. (S. L., 1907, p. 91.)

At least one Saturday in each month during which the public schools may be in progress shall be devoted to township institutes, or model schools for the improvement of teachers; and two Saturdays may be appropriated, at the discretion of the trustee of the township. * * * The township trustee shall specify, in written contract with each teacher, that such teacher shall attend the full session of each institute contemplated herein, or forfeit one day's wages for every day's absence therefrom, * * * and for each day's attendance at such institute each teacher shall receive the same wages as for one day's teaching. (S. L., 1907, p. 290.)

The work for these meetings or institutes is outlined by the State department and is largely based on the reading circle work. The pamphlet containing the outlines contains programs for seven meetings, full outlines (33 pages) of Allen's "Civics and Health," and McMurry's "How to Study," the books adopted for the reading circle, besides brief discussions or outlines of the following topics: Deficiencies in English, deficiencies in spelling, the query box, open-

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ing exercises, the teacher's spirit, United States postal service, play and education, suggestions for raising library funds, and the young people's reading circle.

The introduction to the outline and three of the programs are inserted.

THE TOWNSHIP INSTITUTE.

The township institute costs the State of Indiana a large sum of money. Whether the State gets value received in return depends upon the attitude and work of teachers and school officials. The institute has been a great factor in the improvement of our schools. It has done much to develop the teachers, both professionally and intellectually. Many of the foremost teachers of the State testify to the great part it has had in their growth.

The law contemplates that the township institute shall be a model school. This surely means that the very best school conditions shall exist. The program should be definite and the work thorough. The usual school rules on punctuality and attendance should be enforced. No teacher who shirks duty or whose attendance is short of the full day should receive pay.

One of the most potent factors in the success of the institute is the township trustee. He should be present at every meeting. His presence is an encouragement to the teachers. In these meetings he gets at first hand the best possible knowledge of his teachers. He is also brought into close contact with the purposes of his teachers and with the needs of his schools.

A township institute can not be a great success if the number of teachers is too small. For the best work the number should range from 12 to 25. Small townships should arrange for joint meetings. An occasional joint meeting of all the townships in the county is a splendid thing.

If not possible at every meeting, certainly several times during the year, provision should be made for real class work. In most localities a class of children can be provided and an actual model recitation given. If this is done with proper care its value will be great, indeed. The reading circle studies furnish a splendid chance for model recitation work. The leader is the teacher, and the other members of the institute as the class, gives an opportunity for fine results. Perhaps the very best reading circle work of the past year was done in this way.

Part of every township institute session should be given to a discussion of county or township problems. In each program one period is left open that it may be used in this way. The county superintendent, trustee, and principal should select the proper topics.

Patrons should be encouraged to attend the meetings of the township institute. Much of the indifference to schools is due to ignorance of their methods and aims. The discussions in a good, live institute will instruct and enlighten patrons, as well as improve and inspire teachers. Patrons should be encouraged not only to attend, but also to participate in some of the discussions and occasionally to lead in the presentation of some topic. Teachers may be greatly helped by getting the patrons' point of view.

It is the purpose of this outline to be suggestive. It is hoped that it may be a help to every teacher.

Preliminary institute.

9.00 a. m. 1. Opening exercises.[1]
9.15 a. m. 2. How to study. Chapters I and II.

[1] NOTE.—At each institute some one should be designated to conduct the opening exercises as a model exercise for opening school. It is recommended that much careful thought be given to this part of the program so that the work of the day may begin on a high plane.

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10.00 a. m. 3. Play as a factor in education.
10.30 a. m. Intermission. Program committee arrange work for next institute.
10.45 a. m. 4. Civics and health. Chapters I to IV, inclusive.
11.30 a. m. 5. The teachers' reading circle work for the present year. (The speaker should point out some definite practical good that can be done in the schools during the year along the lines discussed in each book.)
12.00 m. Noon intermission.
1.30 p. m. 6. Address by the county superintendent. Addresses by trustees present.
2.00 p. m. 7. Discussion of plan for collecting data concerning pupils' English and spelling.
2.30 p. m. 8. Primary reading. Devices and methods to be presented by a designated leader. Discussion to be followed by a general discussion.
3.00 p. m. 9. The township institute. Discussion of introduction. Suggestions for the good of the institute.
10. Remarks by parents and other visitors present. Assignments for next institute.
4.00 p. m. Dismissal.

Third Institute.

Patrons' Day.

9.00 a. m. 1. Opening exercises.
9.15 a. m. 2. How to study. Chapter V.
10.00 a. m. 3. Deficiencies in spelling. Subject to be presented by a leader and followed by a general discussion. This discussion should be concerning the kind of errors, reasons for poor spelling, and the remedy.
10.30 a. m. 4. Intermission. Program committee arrange work for next institute.
10.45 a. m. 5. Civics and health. Chapters X to XV, inclusive.
6. How to use the dictionary.
7. Selected subject.
12.00 m. Noon intermission.
1.30 p. m. 8. Address by a school patron.
Address by township trustee on proper heating and ventilation of school buildings.
2.00 p. m. 9. Play as a factor in education.[1] A round-table discussion to be conducted by the chairman.
10. Relation of the school and the home. Subject to be presented by a teacher and a patron. General discussion.
2.45 p. m. 11. Opening exercises, purpose and nature.
3.00 p. m. 12. Address by a physician on sanitation and prevention of disease.
13. Address by a dentist on care of the teeth and importance of same.
Assignment of work for next institute.
Dismissal.

Sixth Institute.

9.00 a. m. 1. Opening exercises.
9.15 a. m. 2. How to study. Chapter X.
10.00 a. m. 3. Model recitation in geography, based on Indiana. If the topic is too broad, the program committee should fix the limits of the assignment. Use institute as a class.

[1] This topic was discussed at the first institute. It is hoped that teachers will test the theory as to the value of play as a factor in education, and that the round-table discussion, being the result of actual observation, may prove to be interesting and helpful.

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10.30 a. m. 4. Intermission. Program committee arrange work for next institute.
10.45 a. m. 5. Civics and health. Chapters XXVII to XXXI, inclusive.
11.30 a. m. 6. Selected subject.
12.00 m. Noon intermission.
1.30 p. m. 7. The teacher's spirit.
2.00 p. m. 8. Symposium. Each teacher will state what practical good, if any, has come to his pupils and the community through an application of some of the things taught in "Civics and health" and "How to study."
2.45 p. m. 9. Explain the conservation movement in the United States.
3.15 p. m. 10. Model recitation in United States History, based on territorial growth. Use institute as a class.
Assignment of work for next institute.
4.00 p. m. Dismissal.

KENTUCKY.

The Kentucky law has the following anomalous provision:

During the session of the institute there shall be held a county teachers' association, and one hour in the afternoon or night a meeting shall be daily set apart for this purpose. The association may be composed of all the officers and teachers of the common schools present, and shall be called together by the county superintendent, who shall be ex officio president. The object of the association shall be, primarily, to discuss and devise the best ways and means of promoting the interest of education, the improvement of teachers, and the methods of teaching, and especially to devise means for securing better schoolhouses, better attendance, and local aid for common schools. The said association shall be a permanent organization, with one vice president for each magisterial district, to be elected or appointed; and shall hold at least one meeting in each magisterial district, besides the meeting at the institute during the first six months of each school year. Every teacher shall attend, at least, the meeting held in the magisterial district in which he shall teach, and upon failure to do so shall teach an additional day during the school month following such failure, unless he shall satisfy the county superintendent that each failure was caused by sickness or other actual disability. The county superintendent shall attend each meeting of the association, and shall prepare or have prepared a program of the exercises therefor. (S. L., 1910, p. 73.)

This provision may be anomalous merely in the name assigned to the meeting, for the name "teachers' association" is by custom used to designate a voluntary gathering of teachers with no official supervision or penalties. But all peculiarities aside, this provision is of interest at this point because it gives expression to the need for an official teachers' meeting that is closer to the schools than the county institute. The meeting provided should obviously be classified as a local teachers' meeting. It is official, and no choice is left to the teacher except to attend or be penalized.

LOUISIANA.

The Louisiana law pertaining to parish institutes or association meetings, as amended in 1910, reads as follows:

It shall be the duty of every parish superintendent of education to conduct a teachers' institute or association on one Saturday of every month or, in his discretion, on a

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Friday and Saturday of every alternate month during the time the public schools are in session in his parish, in each institute district. * * * The daily session of the teachers' institute or association shall be not less than five hours per day actual work. (S. L., 1911, p. 42.)

Attendance upon these meetings is compulsory; and the programs, which include the reading circle work, are prepared by the State institute conductor. They are, however, prepared in outline only, so that the parish superintendent is not especially handicapped thereby. He is left abundant opportunity to bring in work of a local nature.

The value of a meeting just before the schools open is recognized, and a preliminary meeting for that time is recommended. The following extracts and programs are taken from "Outlines of Parish Teachers' Institutes" for 1910–11.

It is recommended that the first meeting in every parish be held during two days just preceding the opening of the session.

At this meeting all record blanks that need explanation should be taken up as well as many other details in connection with the organization and administration of schools.

The reading course books should be on hand at the first meeting and the teachers supplied with them. Assignments should be made at this preliminary meeting for the next regular meeting.

Suggested Program for Preliminary Meeting.

First Day.

1. Music.
2. Opening remarks by the superintendent.
3. Addresses by invited guests.
4. Discussion of State course of study.
   (*a*) High school.
   (*b*) Elementary graded schools.
   (*c*) Elementary rural schools.
5. Instructions to teachers relative to—
   (1) Keeping records and making reports.
   (2) Incidental fees; when and how collected; disposition of funds; the new law.
   (3) Care of school property; improvement of same.
   (4) School gardens; corn clubs; agriculture; nature study.
   (5) Special instructions suggested by the experience of the superintendent.
   (6) Discussion of special work to be done during the session, such as establishing libraries, corn clubs, school improvement, etc.

Second day.

1. Music.
2. Distribution of reading course books.
3. Assignment of work for the first regular meeting.
4. The question box.
5. The first day of school (1 hour) [21 subtopics are suggested under this head].
6. Appropriate opening exercises.
   (*a*) Purpose of opening exercises.
   (*b*) Kind and scope for the different grades. [10 subtopics are suggested under this head.]
7. Lesson or talk by supervisor of music, drawing, or supervisor of elementary schools of the parish.

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In addition to these two programs, 18 topics, each minutely analyzed, are suggested for round-table conferences.

The program suggested for the third meeting is as follows:

9.00 a. m.—1. Model opening exercise.
9.15 a. m.—2. How to study.
10.15 a. m.—3. Superintendent's critique.
11.00 a. m.—4. Recess.
11.10 a. m.—5. (*a*) Education for efficiency (high school).
(*b*) The place of industries in public education (elementary schools).
12.00 m. Noon intermission.
1.00 p. m.—6. Singing.
1.15 p. m.—7. Civics and health.
2.00 p. m.—8. How to test seed corn in school.
3.00 p. m.—9. Assignments and adjournment.

This is followed by 10 pages of outlines and illustrations before the program for the fourth day is taken up. In part explanation of the program it should be said that the books adopted in the reading course for 1910–11 are Davenport's "Education for efficiency," McMurry's "How to study," and Allen's "Civics and health." The criticism might be made that the immediate problems of the schools are not given enough time and the reading work too much, but this need not necessarily be valid, for the school problems can be discussed in connection with the reading work. That this is actually done is indicated by the outlines in the manual.

MINNESOTA.

The Minnesota law reads as follows:

The county superintendent may hold county institutes for teachers in different parts of the county not to exceed five (5) such institutes in any one (1) year, and the county commissioners shall allow bills for personal expenses for said county superintendent in holding such institutes not to exceed the sum of fifty dollars ($50) in any one (1) year. (S. L., 1907, p. 104.)

NORTH DAKOTA.

The North Dakota law reads as follows:

Acting under the instruction of the superintendent of public instruction, he (the county superintendent) shall, when expedient, convene the teachers of his county at least one Saturday in each month during which the public schools are in progress, or if the distance is too great he may convene the teachers of two or more districts in each of the several portions of his county in county or district institutes, or teachers' circles, for normal instruction and the study of methods of teaching, organizing, classifying, and governing schools, and for such other instruction as may be set forth by the superintendent of public instruction for the State teachers' reading circle. Each teacher shall attend the full session of such institute or circle and participate in the duties and exercises thereof or forfeit one day's wages for each day's absence therefrom. (S. L., 1909, p. 25.)

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OREGON.

The Oregon law reads as follows:

It shall be the duty of each county superintendent to organize and hold annually at least three local institutes or educational meetings in various parts of his county at such times and places as he may deem expedient, and he shall secure at these meetings, as far as practical, the attendance and cooperation of school officers, teachers, and parents. (S. L., 1911.)

SOUTH DAKOTA.

The South Dakota law reads as follows:

The county superintendent shall divide his county into districts as may be convenient for the purpose of holding district teachers' institutes during the school year on Saturdays, and all teachers employed in the schools of each institute district shall be required to attend the meetings in such district but not less than two nor more than four such meetings shall be held in each district during any school year, nor shall such meetings be held oftener than once in two months * * *. Each meeting shall consist of one session of approximately three hours. The program shall be so arranged that all teachers of the district shall be given an active part as often as practicable. The work as outlined by the State teachers' reading-circle board shall constitute one-third of the work, and the balance of the program shall also be for the general improvement of the teachers. (S. L., 1909, p. 42.)

UTAH.

The Utah law provides "that institute meetings held once or twice a month each year shall be equivalent to the annual institute mentioned in this section." (S. L., 1909, p. 15). This allows the substitution of teachers' meetings for teachers' institutes.

VIRGINIA.

The practice in regard to teachers' meetings followed in Virginia is something like that of Indiana. Two laws bear upon the meetings that should be considered here. One of these laws provides specifically for teachers' meetings, while the other provides for teachers' institutes, which have in Virginia, however, definitely become preliminary teachers' meetings held about the time the schools open. The laws read as follows:

The district superintendent shall encourage and assist in the organization and management of county institutes, of which at least one shall be held during each school session. (S. L., 1907, p. 133.)

County and district school boards may encourage meetings of teachers to be held from time to time in any county or school district under such regulations as the division superintendent of schools may prescribe. (S. L., 1907, p. 62.)

The meetings held under the institute law are usually two days in length, are conducted by the division superintendents and State examiners without extra pay, and are set as near as possible to the opening of the schools in the fall.

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Under the second law quoted, district teachers' meetings are held one day each month, usually on Saturday, in nearly every county of the State.

With the old-time institute practically eliminated, and with strong summer schools, efficient local teachers' meetings, and an excellent system of voluntary teachers' conferences and associations, the machinery for the training and improvement of teachers in service has made especially good progress in Virginia. It is simple, yet it meets all the essential professional needs without wasteful duplication.

WEST VIRGINIA.

The West Virginia law reads as follows:

> The county superintendent shall arrange for and conduct district institutes or teachers' round tables, one or more in each district of his county within the school year, and any teacher who shall attend his district institute for one school day shall have credit therefor, when reported by the county superintendent in the month in which said institute is held, as if actually taught by him. (S. L., 1908, p. 51.)

The district institutes and teachers' round tables held under this law have apparently developed into two types of meetings, the round table including a larger territory than the county, and the district institute a smaller territory. The State superintendent, in his report for 1906–1908, page 140, says:

> A most wholesome influence that has entered into our educational progress within the last few years is the work done in connection with what is known as a series of round tables held in different parts of the State. By rather a peculiar coincidence these informal organizations have largely taken the name of the section of the State in which they are located, as Ohio Valley round table, Monongahela Valley round table, Greenbrier Valley round table, Potomac Valley round table, Tyart's Valley round table, etc. Usually these meetings last a day and a half, consisting of two sessions on Friday and one session Saturday forenoon. On some occasions the attendance has exceeded 300, in this respect far exceeding the enrollment of the State association. A chairman is chosen for each session it may be, or for all meetings of one round table. The program is announced some weeks beforehand and the discussions are pointed, practical, and progressive * * *. Sometimes the Friday's attendance at the round table counts as a day taught where teachers have not had a district institute, but in many places the teachers willingly suspend their schools to attend the round table and make up the day.
>
> The especial advantage of these meetings is that they are always held when the schools are in session and the problems that present themselves from time to time in the schoolroom are fresh in the minds of the teachers.

OTHER STATES.

The States mentioned are the only ones in which local teachers' meetings for rural teachers are legally established, but meetings of this kind are held also in Illinois, Iowa, Kansas, Pennsylvania, Washington, and perhaps other States. The following program illustrates this work as it is carried on in the State of Washington:

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Program of educational meeting to be held at St. John, Wash., Saturday, January 23, 1909.

Morning session, 10 o'clock.

The recitation ..... C. L. Henry, Jessie Randle.
General discussion.
Primary methods ..... Ermah Greer, Nellie Stone.
General discussion.
The A. Y. P. exhibit ..... General discussion.

Afternoon session, 1.30 o'clock.

The school and the citizen ..... Walter Ricks, A. P. Orth.
General discussion.
Method in grammar ..... O. A. Burch.
General discussion.
Difficulties in teaching arithmetic ..... E. T. Morris, L. L. Nolin.
General discussion.
Address ..... Supt. N. D. Showalter.

It is evident from the laws and programs that have been quoted that local teachers' meetings have gained a substantial foothold in the rural districts. The name applied to these meetings, however, is an unsettled matter. The word "institute" is most frequently used in the laws, but this tends to confuse these meetings with the regular county institute, which is unfair. Teachers' institutes have been frequently criticized, but not teachers' meetings. The expression "teachers' meeting" would amply cover the point and would be parallel with the designation of corresponding meetings of teachers in cities.

In all the States mentioned, except Virginia, the regular five-day teachers' institutes are also prescribed by law and are held once a year.

In Tennessee and Vermont the State superintendents are given an additional means to influence the schools. They are by law empowered to hold meetings and conferences that are entirely local in their nature.

The Tennessee law empowers the State superintendent—

> to suspend the schools of any county for one day each year, when he may deem it necessary, upon giving proper notice, and to require all teachers and school officers, upon the day so appointed, to attend at a designated hour and place for the purpose of instruction and conference. (S. L., 1909, p. 5.)

In Vermont the State superintendent "may hold educational meetings in different towns in each county and employ competent assistants." (S. L., 1907, sec. 918.)

TEACHERS' MEETINGS IN CITIES.

The foregoing discussion of teachers' meetings has reference primarily to rural districts, but the general remarks that have been made apply in the main also to urban communities. The needs for

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teachers' meetings in city and country are much alike, but because the schools are closer together in cities these needs are more urgently felt there and have for many years been more systematically met.

The teachers' meetings held in cities fall into five distinguishable classes. These are (1) general teachers' meetings, (2) building meetings, (3) meetings with special supervisors, (4) grade meetings, and (5) principals' meetings.

To this list might be added teachers' clubs and round tables, but as these are usually voluntary they should be classed with teachers' associations. Gatherings of this kind are, however, held very generally in cities and they exert a great influence on the professional improvement and the development of an esprit de corps among the teachers. In fact, they supply a need that the official meetings do not reach and for that reason the superintendent and other officials should tactfully take the initiative in getting them started where they do not already exist. Once underway they usually need little further official encouragement.

These voluntary associations will seldom reach all the teachers, or even a majority of them, but their influence usually extends far beyond their immediate membership. They set a standard of professional activity and growth that has a leavening influence on the entire teaching corps.

General teachers' meetings are usually, if not always, enjoined by the rules and regulations of the board of education, and they are almost always held monthly, whether the rules enjoin them that often or not. Monthly meetings are enjoined in many cities, but in a larger number their frequency is left primarily with the superintendent. He is given the power to call meetings whenever he thinks the welfare of the schools requires them.

The functions of the general teachers' meetings are primarily administrative, legislative, and inspirational.

On the administrative side the superintendent needs an occasional gathering of all his teachers in order to put into uniform effect all general rules and policies of the school system. For maximum efficiency there must be team work in the teaching corps, and this can be brought about best through the teachers' meeting, although this agency may be effectively supplemented by printed and mimeographed instructions. Then, too, there are usually some general criticisms brought to light through supervision that may be most effectively made at the general meeting.

New policies and the amendment of old ones may be made either arbitrarily by the superintendent and the board or they may be determined primarily by the teachers themselves. When the teachers themselves are given a voice in these legislative matters the final discussion and vote should usually fall in the general meeting.

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The inspirational feature, in which should be included all those features that tend to keep the teachers abreast of educational thought, is the same as that which has been discussed in connection with institutes and rural teachers' meetings. City-school teachers need this feature no less than others and it is the duty of the administrative and supervisory officers to supply it.

That aspect of the general teachers' meeting which aims for the inspiration and professional growth of the teachers rightly forms one of its leading features. Books of a professional nature are frequently read and discussed in these meetings and in many places lectures by outside talent are given. This causes these meetings to resemble teachers' institutes and in some places the term "institute" is applied to them. This is true, for example, in Springfield, Ill.; Kansas City, Mo.; Rochester, N. Y.; and in Dallas and Houston, Tex.

The building meeting is, as a rule, but a smaller edition of the general meeting. It bears the same relation to the teachers of the building as the general meeting bears to the teachers of the entire city. The principal needs this meeting for administrative, supervisory, and other professional purposes, just as the superintendent needs the general meeting.

By special supervisors' meetings are meant those meetings that are presided over by supervisors of drawing, music, nature study, penmanship, and the like. These supervisors need occasional meetings with all or part of the teachers to give unity to their work and to outline methods of instruction.

The grade meeting, which is nearly as universal as the general meeting, is needed for those detailed problems of schoolcraft that concern directly only a relatively small group of teachers. Among these problems may be mentioned especially those of methods of instruction and the apportionment of subject matter. These vary as one passes from grade to grade, and it would be wasteful to consider them at the general meeting.

Principals' meetings are on a less official plane than the other meetings just discussed. It is not often that they are mentioned in the rules and regulations of the boards of education, and they are frequently voluntary. Yet in cities having many separate buildings the principals have numerous problems in common, and it is of distinct benefit to the schools to have these problems discussed by the principals and to have uniform policies adopted by them. Furthermore, because the principals are rightly looked upon as the professional leaders of the teachers under them, they must themselves receive inspiration and professional stimulation. This they may do effectively through their own meetings.

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In 150 school reports examined, mention of principals' meetings was made in those from only 10 cities. No doubt more are held, for it is not likely that all superintendents mention these meetings even when they occur.

The meetings in these 10 cities are held either weekly, biweekly, or monthly, and in connection with several of them systematic study is carried on.

The following is a typical schedule of teachers' meetings as they are held at Winona, Minn.:

SCHEDULE OF TEACHERS' MEETINGS, WINONA, MINN.

Unless otherwise stated, all meetings at 4 p. m. at high-school building.

Kindergarten: Monday, first week of each school month.

First and second grades: Tuesday, first week of each school month.

Third and fourth grades: Wednesday, first week of each school month.

Fifth and sixth grades: Monday, second week of each school month.

Seventh and eighth grades: Tuesday, second week of each school month.

Special supervisors: Wednesday, second week of each school month.

Principals: Wednesday, third week of each school month and 10 o'clock Saturday previous to the opening of schools in September.

General meetings: 2 p. m., the Monday before opening of school in September.

General meetings: 4 p. m., the last Friday of each school month.

Building meetings: Principals will hold meetings of teachers in their respective buildings as often as the needs of the school may require.

Supervisors' meetings: Supervisors will hold grade and building meetings as often as they are deemed necessary by the supervisors and superintendent.

The work that is done in the various teachers' meetings held in a city may be illustrated by the following extract from the Report of the Board of Education, Decatur, Ill., for 1909, prepared by Supt. H. B. Wilson:

TEACHERS MEETINGS AT DECATUR, ILL.

PROFESSIONAL MEETINGS.

The professional work of the year sought to build upon what had been accomplished the preceding year (see 1908 report, pp. 17–20), hence the work was organized and differentiated along lines similar to those pursued the year before. The work done will be tersely indicated under the head of each kind of meeting held.

GENERAL MEETINGS.

We were fortunate in the following list of speakers and topics. Each address was of great inspirational value.

The agencies of the school, September 5, superintendent of schools.

The use and interpretation of maps, September 25, R. H. Allin, Chicago.

The ideal teacher, November 6 (home of superintendent of schools), Prof. W. C Bagley, University of Illinois.

Some essentials of language power, December 11, Supt. W. A. Furr, Jacksonville, Ill.

The new boy, December 21, A. E. Winship.

Taking advantage of the play instinct in arithmetic work, January 20, Prof. C. W. Stone, Farmville (Virginia) State Normal.

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Teaching children to study, February 16, Prof. George D. Strayer, Columbia University.

Language in the grades, February 26 (two lectures), Supt. O. I. Woodley, Passaic, N. J.

Meetings of the Central Illinois Teachers' Association in our city March 19–20.

CABINET MEETINGS.

November 5: Earhart's Factors in logical study.

December 10: Earhart's Factors in logical study (completed).

I regret that the limits of this report prevent me from speaking of the excellent effects which followed in some of the schools from the study of Miss Earhart's work by our teachers. More will be done next year, and in the report a year hence I shall wish to discuss the important matter of teaching children to study in some detail and to recount some of our own experiences, perhaps.

February 11: The educational situation, Dewey.

March 11: Ethical principles underlying education, Dewey.

April 20: Ethical principles underlying education, Dewey (completed).

May 20: Interest as related to will, Dewey.

The cabinet meetings were of great value to all. Attendance upon them was required of the principals and special teachers only, but any other teachers were at liberty to come. With one exception, they were so largely attended that we were compelled to provide chairs in one of the large high-school session rooms to seat all who came. In these meetings the discussion, while more theoretical than immediately practical, was always finally focused upon our local problems and their solution. Discussion ran free in all these meetings, making them of great inspirational value.

GRADE MEETINGS.

Grades 1, 3, and 5: September 17, Motivizing school work.

Grades 1, 3, and 5: October 9, The new copy books and their use, B. D. Berry, Chicago.

Grades 1, 3, and 5: October 22, Motivizing school work (continued).

Grades 1, 3, and 5: December 4, An organic view of some factors of the school.

Grades 1, 3, and 5: February 4, the second term's work.

Grades 1, 3, and 5: April 29, examination papers in arithmetic.

Grades 2, 4, and 6: September 18, Motivizing work.

Grades 2, 4, and 6: October 9, The new copy books and their use, B. D. Berry, Chicago.

Grades 2, 4, and 6: October 23, Motivizing school work (continued).

Grades 2, 4, and 6: December 4, An organic view of some factors of the school.

Grades 2, 4, and 6: February 5, the second term's work.

Grades 2, 4, and 6: April 30, examination papers in arithmetic.

Grade 7: September 21, Motivizing school work.

Grade 7: October 9, The new copy books and their use, B. D. Berry, Chicago.

Grade 7: October 26, Motivizing school work (continued).

Grade 7: December 4, An organic view of some factors of the school.

Grade 7: February 8, the second term's work.

Grade 7: May 3, examination papers in arithmetic.

In addition to the above meetings, the first-grade teachers held five meetings in a study of primary reading work. Miss Barnett, at the E. A. Gastman School, and Miss Montgomery, at the Warren Street School, began a test of the merits of the Aldine reading system during the second semester, and two visits to see the work of each teacher were made by all of the first-grade teachers. The second-grade teachers were present also at one visit with each of the teachers. Following the observation of the

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work, at each visit, problems growing out of the work visited or out of primary reading in general were discussed in round table. Near the close of the year all of the first and second grade teachers visited Miss Alice Mead's first-grade reading work to note the excellent results she was securing in the development of her 1B reading upon the basis of Mother Goose rhymes.

BUILDING MEETINGS.

These meetings were held under the direction of the principal in each building every four to six weeks. Reports lead me to believe these meetings were well planned and very profitable.

Elementary schools.—Discussions based upon Prof. W. C. Bagley's "Classroom management."

High school.—Discussions based upon Prof. DeGarmo's "Principles of secondary education." This discussion was preceded at each meeting by a report, followed by discussion, upon articles of educational significance in the current magazines.

The following programs were executed during the school year:

October 12, 3.30 p. m., in physical laboratory: English in the high school.

November 10: Mathematics.

December 9: The languages.

January 14: The sciences.

February 12: History.

March 8: Economics.

April 13: (a) Art. (b) Physical education.

May 12: Some of the problems of administration.

Reports in reference to recent conventions.

But one meeting distinctively for principals was conducted during the year. This was a business meeting near the opening of school.

Also, but one meeting of the janitors was held. At this meeting we considered the relation of the janitor's work to the welfare of the school.

Among the most important meetings of the year were those of the committees working on the course of study in the English group of subjects.

VISITING DAYS.

The custom and the possibilities of having teachers observe the work of other teachers is indicated by one of the paragraphs just quoted from the Decatur School report. This custom is generally known by the expression of "visiting days," and is practiced in approximately 50 per cent of our city schools. Miss Shipp, in an unpublished study on "Elementary Supervision" prepared for a master's essay at Teachers College, Columbia University, in 1907, found that 19 of the 39 cities studied by her made provision for visiting days.

The usual amount of time allowed by the rules and regulations of school boards for visiting with pay is either one or two days a year, with the tendency in favor of one day. When but one day a year is allowed, the rules usually provide that this shall be taken in installments of one-half day a semester when the visiting is done in the home city.

Visiting in the home city is usually done under the immediate guidance of the superintendent or a supervisor, and the visits are

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followed by joint discussions. When the visiting is done away from home, permission to do so must usually be granted by the superintendent, and the teacher is required either to file a written report or to give an oral report before a teachers' meeting. A few cities provide directions to guide teachers in their observations.

Principals are also granted visiting days without loss of salary in some cities. Minneapolis and Milwaukee, for example, each provide that principals may visit the schools of other cities for five days each year. In Minneapolis the principals are required to make to the superintendent written reports of their visits.

Superintendents are almost invariably enjoined by the rules of school boards to keep themselves informed of educational movements in other places, and they are usually granted all the time they need for visiting the schools of other cities.

Visiting days offer opportunities for the improvement of teachers in service in several directions. They offer effective means (1) of introducing new methods and devices, (2) of strengthening the work of the weaker teachers, and (3) of revivifying the work of all teachers, even of the best.

The use of visiting days for the purpose of studying and introducing new methods and devices is sufficiently illustrated by one of the paragraphs in the quotation from the Decatur School report given above.

Visiting for the purpose of improving teaching efficiently is in many cities done by groups of teachers under the guidance of the superintendent or a supervisor. This is the custom, for example, in Indianapolis, Baltimore, and Springfield, Mass.

In Indianapolis visiting is usually done in a group in charge of a supervising principal or assistant superintendent, and the observations are discussed in the presence of the teacher visited.

In Baltimore the district supervisors occasionally—

> take complete charge of a given grade for an entire morning, at which time all teachers of that grade within the given group of schools are excused from teaching to attend this model half-day session. The afternoon of the same day is spent by the same teachers in discussing principles underlying the work observed. Such demonstrations and meetings are held for teachers of all grades. (Quoted from Miss Shipp's study.)

> In Springfield we sometimes call together the teachers of one grade to spend an afternoon in observing recitations conducted by several skillful teachers, all of whom will take up the same subject, and we have found such illustrative lessons very helpful and stimulating. In this way a few especially able teachers will materially strengthen the work of their grade throughout the entire city. (W. F. Gordy, Proceedings, N. E. A., 1907, p. 259.)

Judging by the provisions in the rules and regulations of school boards, one would infer that most of the visiting by teachers is of a general nature; but this inference may be wrong. Even though the

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provisions are general, it may well be true that superintendents usually make use of visiting days for the purpose of improving their teachers either individually or in groups, at specific points. But it is true, nevertheless, that much visiting of a general nature is done by teachers. This may on the whole be less profitable than visiting singly or in groups under official guidance, but it is certainly not without its value. It gives the teacher new ideals, new points of view, and a change of scene that are heartening. The teacher returns to his work not only instructed, but also encouraged with his own achievements and efficiency.

The smaller teachers' conventions are frequently held on Friday and Saturday with the specific provision that Friday forenoon or afternoon shall be devoted to visiting the schools of the city in which the convention is held. The Central Ohio Teachers' Association, among the larger conventions, always includes the visiting of schools in its program. For this purpose it frequently meets outside of its own boundaries, and even outside of its own State. It has in recent years held meetings in Cincinnati, Cleveland, Indianapolis, and Detroit.

COUNTY SUPERINTENDENTS' CONFERENCES.

Reference has been made to the fact that the State superintendent needs avenues through which he can exert an influence on the educational forces of his State. One of these avenues is the meeting of county superintendents. Such meetings are held in about two-thirds of the States. (See Table IV.) They take on a variety of forms, in some cases being sections in the State associations, while in others they are convened by the State superintendent according to statutory enactment; but through practically all of them the State superintendent can exert an influence for greater unity and efficiency in the educational system of the State.

To convene the county superintendents is made one of the legal powers and duties of the State superintendent in 10 States. These are Florida, Idaho, Iowa, Minnesota, Mississippi, North Dakota, Oregon, South Dakota, Washington, and Wisconsin. But this list does not include all the States in which meetings of the county superintendents are called by the State superintendent. They are called in New Hampshire under the institute law, as was noted on page 9, and under still other laws, or perhaps voluntarily, in some of the other States.

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TABLE IV.—*Teachers' associations.*

State.	County superintendents' conferences.	County associations.	Sectional or district meetings.	State associations.
Alabama	Yes	Yes		Yes.
Arizona	Section in State association.	No	Yes	Yes.
Arkansas	Section in State association.	18	3	Yes.
California	Yes	Yes	Yes	Yes.
Colorado		Yes		Yes.
Connecticut	Yes	Yes	Yes	Yes.
Delaware	No	Yes	Yes	No.
Florida	Yes	Yes	No	Yes.
Georgia	Yes	Yes	No	Yes.
Idaho		Yes	Yes	Yes.
Illinois	Yes	88 in 1909	7	Yes.
Indiana	2		2	Yes.
Iowa	2 annually	Yes	4	Yes.
Kansas	Yes	Yes	8	Yes.
Kentucky	Yes	Yes	Congressional districts.	Yes.
Louisiana	Yes	Yes	No	Yes.
Maine	Superintendents	Yes		Yes.
Maryland	Yes	Yes	Yes	Yes.
Massachusetts	Superintendents	Yes	No	Yes.
Michigan	Yes	Yes	Yes	Yes.
Minnesota	Yes	Yes	Yes	Yes.
Mississippi	Yes	35-40	4 or 5	Yes.
Missouri	Yes	35-40	4 or 5	Yes.
Montana	Yes	No	No	Yes.
Nevada	No	No	No	Yes.
New Hampshire	Yes	Yes	Yes	Yes.
New Jersey	Yes	21	Yes	Yes.
New Mexico	Section in State association.	In all counties	No	Yes.
New York	Yes	In all counties	Yes	Yes.
North Carolina	Yes	In all counties	Yes	Yes.
North Dakota	Yes	40	12	Yes.
Ohio		Yes		Yes.
Oklahoma	Public-school officers' association.	77 (all counties)	3	Yes.
Oregon	Yes	No	No	Yes.
Pennsylvania			No	Yes.
Rhode Island		1	7	R. I. I. I.
South Carolina		Yes	No	Yes.
South Dakota	2 annually	Yes	3	Yes.
Tennessee	Yes	Yes	Yes	Yes.
Texas	Yes	District	12	Yes.
Utah		Yes	Yes	Yes.
Vermont	Union supt.	Yes	No	Yes.
Virginia	Yes	About 85	Yes	Yes.
Washington	Yes	About 75 per cent of counties.	No	Yes.
West Virginia	Yes	¾ of counties	3	Yes.
Wisconsin	Yes	Yes	3	Yes.
Wyoming	No	No	No	Yes.

The legal provisions for county superintendents' conferences are quite similar in the 10 States mentioned, and only a few need to be quoted for illustrative purposes.

FLORIDA.

The Florida law empowers the State superintendent—

to call conventions of county superintendents of public instruction for obtaining and imparting information on the practical workings of the school system and the means of promoting its efficiency and usefulness. (S. L., 1909, p. 10.)

NORTH DAKOTA.

The following wording of the law, with but slight changes, is used also by Idaho and Mississippi:

He [the State superintendent] shall meet the county superintendents of each judicial district, or of ten or more districts combined, at such time and place as he shall

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appoint, giving them due notice of each meeting. The objects of such meeting shall be to accumulate valuable facts related to schools, to compare views, to discuss principles, to hear discussions and suggestions relative to the examinations and qualifications of teachers, methods of instruction, textbooks, institutes, visitation of schools, and other matters relating to the public schools. (S. L., 1909, p. 21.)

WISCONSIN.

The State superintendent of Wisconsin is instructed—

to hold at least one convention annually at a convenient and accessible point in the State for the purpose of consulting and advising with the county superintendents with regard to the supervision and management of the public schools.

To hold one convention annually for the purpose of consulting and advising with the city superintendents of schools upon matters pertaining to supervision and management of city schools. (S. L., 1909, p. 305.)

The practice of holding county superintendents' conferences in States in which the law does not specifically direct such conferences may be exemplified by Illinois. The law of this State merely directs the State superintendent—

to advise and assist county superintendents of schools, addressing to them, from time to time, circular letters relating to the best manner of conducting schools, constructing schoolhouses, furnishing the same, and examining and procuring competent teachers. (S. L., 1909, p. 3.)

Under this law annual conferences are held with the county superintendents usually at the State normal schools and at the university. The superintendent of public instruction also meets the county superintendents in annual session at the State teachers' association. The practice in many other States is similar.

While the State superintendent in nearly every State takes a direct part in the conferences with county superintendents and in the inspection of rural schools, he is now usually ably assisted in this work by rural-school inspectors. These inspectors, acting with the advice and assistance of the State superintendent, are a very material aid in the improvement of the rural-school teacher, as well as in all other phases of rural-school work.

TEACHERS' ASSOCIATIONS.

The expression "teachers' associations" is restricted in this paper to those conventions that teachers form of their own free will and in which all the members are legally on an equal footing. The officers of the association are elected by the members and are responsible to the members.

This is the ideal, but in practice it is not always found in its pure form. The law not infrequently gets the various types of teachers' gatherings considerably mixed. In Missouri teachers' institutes and in Kentucky teachers' meetings are called teachers' associations in the law, but the descriptions that are given are so distinctive that

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there is no serious trouble in classifying them. This, however, is not true in Maine. Here we find a teachers' convention legally established which is about as much a teachers' association as it is a teachers' meeting. The law reads as follows:

Whenever not less than thirty of the teachers and school officers of any county shall have formed an association under rules of government approved by the State superintendent of public schools, for the purpose of mutual improvement in the science and art of teaching and of creating popular interest in and diffusing a knowledge of the best methods of improving our public-school system, by the holding of conventions at least once every year under the supervision of the State superintendent, the State shall defray the necessary expenses attending the holding of such conventions, for which purpose the sum of one thousand dollars is hereby annually appropriated, to be deducted and set aside therefor by the treasurer of State from the annual school fund of the State; provided, however, that no more than two such associations shall be formed in any county and that the expenses as aforesaid of no more than two conventions of any such association in any year shall be defrayed by the State.

Teachers of public schools may suspend their schools for not more than two days in any year during the sessions of such conventions within their counties and also for not more than two days in any year during the sessions of any State teachers' convention approved by the State superintendent of public schools, unless otherwise directed in writing by the school officers, and attend said conventions without forfeiture of pay for the time of such attendance, provided they shall present to the officers employing them certificates signed by the State superintendent of public schools showing such attendance.

The governor and council may draw warrants on the treasurer of State for the payment of bills for the expenses provided for in section eighty-nine, when such bills shall have been approved by the State superintendent of public schools; provided, however, that no bills shall be so paid except those for advertising such conventions and for actual traveling expenses of speakers and lecturers not residing in the counties in which such conventions are held.

In Oregon, the superintendent of public instruction "shall, once in each year, cause to be held a State teachers' association, at such time and place as in his judgment will best promote the general interests of education." (S. L., 1909, p. 3.)

Under this law two meetings are held annually—one in the eastern and one in the western part of the State—for which the State appropriates annually $1,000, which is divided equally between the two divisions. This fund is supplemented by money from the counties in which the meetings are held and from two to four counties adjoining.

The Vermont law annually appropriates $200 for speakers at the State teachers' association.

In South Dakota teachers are legally permitted to close their schools for five days in any one year to attend a teachers' association, and to make up the time so lost.

In Kansas the teachers are usually allowed their salary for attending the State association, and they are paid $1 for attending the meetings of the county association.

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In the laws of a number of other States teachers' associations are mentioned, and the officials, especially the county superintendents, are encouraged to form them.

The vast majority, however, of these bodies are formed, managed, and financed solely by the teachers themselves.

To the number and variety of voluntary teachers' associations in the United States there is no end. A few are listed in Table IV, but these include only those within State lines and those that are of a general nature. National associations and all associations definitely restricted to certain classes of teachers are omitted. It would be interesting to have a complete list of all such associations, but it would be next to impossible to collect the necessary data.

NATIONAL ASSOCIATIONS.

In the national field there is not only the National Education Association with its various departments, but nearly every class of teachers has its own national organization, which meets at least once a year. There are conventions for music teachers, drawing teachers, manual-training teachers, physical-culture teachers, teachers and devotees of school hygiene, etc., and when the college and university fields are included the list becomes very long, probably exceeding threescore.

FEDERATION OF STATE TEACHERS' ASSOCIATIONS.

A recently established organization of a general nature for teachers is the Federation of State Teachers' Associations. This organization was formed at Denver, Colo., at the time of the meeting of the National Education Association for 1909. Two sessions were held at that time, one on Tuesday, July 6, and the other on Friday, July 9. The by-laws of the federation provide that the annual meetings shall be held at the time of the annual meeting of the National Education Association, and in the same city.

Meetings of the federation were again held at Boston in July, 1910, where over 20 States were represented. At that meeting a constitution and by-laws were adopted.

Membership in the federation is open to State teachers' associations, or equivalent organizations, if known by a different name, through elected delegates; to teachers' associations whose regular membership represents any portion of a State comprising more than one county; and to teachers' clubs or other similar organizations of teachers in cities of more than 100,000 inhabitants.

Two classes of individual memberships are provided for—associate members and delegate members.

Associate membership is open to any teacher on the payment of an annual fee of 50 cents.

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Delegate members consist of individuals, beyond one, that are regularly appointed representatives in the federation, and they also pay an annual fee of 50 cents.

The following extracts from the constitution give further information regarding the nature of this organization:

PURPOSES.

The purposes of the federation are—

To provide for State organizations of teachers in the several States opportunity for conference and for union of effort in matters of common interest, and to act in a definite way as the agent of State teachers' associations in securing timely and efficient concert of action upon educational and professional questions of national significance.

To aid in the development of a feeling of cooperative professional fellowship among all teachers and organizations of teachers in the United States.

To help to realize the ideal of the unity of the Nation through a conscious unity of its educational forces.

STANDING COMMITTEES.

The [nine] vice presidents of the federation shall constitute the standing committee on organization, whose duty it shall be to enlist the support of organizations and of individuals, to increase the membership of the federation, and to promote State and local organizations for the advancement of education and of the interests of teachers.

There shall be a standing committee of five members appointed by the president, whose duty it shall be to note the results of investigations made by the Bureau of Education, the National Education Association, the various State associations, and other agencies, and to formulate recommendations for appropriate action by the federation. This committee shall be known as the "Committee on educational interests."

There shall be a standing committee of five members appointed by the president, to be known as the "Committee on professional interests," whose duty it shall be to take into account the results of investigations into all matters affecting directly the material welfare of teachers, and to make recommendation for appropriate action on the part of the federation.

There shall be a propagandist committee of nine members, the president of the federation being chairman, and the other members of the committee being appointed by the president, whose duty it shall be to promulgate such measures, and to secure favorable action by the proper authorities and by the general public upon such measures as may have been adopted and referred to this committee by the federation. This committee shall have power to add to its numbers at any time such persons of such character and position as may be desirable in carrying on its work.

There shall be a standing committee of three for the preparation and publication of the program for meetings of the federation. Of this committee the secretary shall be chairman, the other members being appointed by the president. This committee shall prepare all blank forms for the conduct of the business of the federation. All printing for the federation shall be in the care of this committee, which shall be known as the "Committee on program and printing."

These national associations offer inducements and good opportunities for travel to all classes of teachers, and they give many a chance to see and hear the educational leaders, but they have little else directly in store for rural, elementary, and even secondary school teachers. They reach these teachers in the main, only indirectly, through their publications and through the educational leaders; but these forces are worth noting. The leaders in the various depart-

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ments of education, as well as other teachers, need opportunities for keeping abreast, for comparing notes, and for social and professional acquaintance, and the publications of the proceedings may be consulted by everybody.

STATE ASSOCIATIONS.

The type of work that is done at the National Educational Association and at the State teachers' associations is so familiar that no space need be taken here for its discussion or for a detailed presentation of programs. The meetings of the State associations are in most States held during the Christmas holidays and usually last three days. Like those of the National Education Association, they are conducted in general sessions held in the forenoon and in sectional meetings held in the afternoon. The evenings are usually given up to social functions and to special meetings.

The sections in the Washington Educational Association, for example, are the following: Educational council; elementary school section; higher and secondary school section; county supervision and normal-school section; music section; manual arts section; mathematical science section; language section; school board section; and commercial section.

EDUCATIONAL CONFERENCES.

In addition to State teachers' associations, passing mention should be made also of State educational conferences. These are usually called by the State superintendent and are attended primarily by the educational leaders of the State. Where held, they probably exert a greater influence in shaping the educational policy of the State than any other single State teachers' meeting.

These conferences, while not without their influence on the improvement of teachers in service, are somewhat remote from this problem, and therefore no attempt was made to determine their number and variety. The State institutes held in Nebraska, and perhaps Nevada, belong in this class.

A conference of this type, held June 6 to 11, 1910, at the University of Mississippi, discussed the following topics: Mississippi's common schools. Subtopics: Their general function; house and equipment; the teacher and other personal factors; the curriculum; consolidation and transportation; revenues. High schools: Purpose and course of study, (a) agricultural, (b) separate district; school improvement; industrial education; professional ethics; a general educational bill; public health. Committees reported on all but one of these topics.

SUPERINTENDENTS' AND PRINCIPALS' MEETINGS.

Another class of meetings that is not included in Table IV is the class of superintendents' and principals' meetings that are held in

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many States, sections of States, or groups of States. These meetings deal primarily with problems of administration and supervision and are frequently of direct value in the improvement of teachers in service.

At the meeting of the North Carolina Association of City Public-School Superintendents and Principals, held at Durham, N. C., January 27, 28, 29, 1910, papers on the following topics were read and discussed: School reports and school efficiency; uniformity in records and reports; report of the committee on economy in the course of study; the supply of textbooks; how to make the teachers' meetings more effective; teaching children how to study; systematic observation and criticism of elementary school work; a comparison of school systems.

COUNTY AND SECTIONAL ASSOCIATIONS.

The associations that reach the rank and file of teachers are the county or sectional or district associations.

When teachers' institutes arose in the nineteenth century they displaced many township and county teachers' conventions. This was regretted by Horace Mann, but he thought that the loss would be more than counterbalanced by the greater professional merits of the institute. If, however, the institute failed to provide for the spontaneous association of teachers, one would expect that in the natural course of events these voluntary conventions would again arise. That this has actually come about is abundantly evident from Table IV.

Taken together, county and sectional or district teachers' associations are probably held in every State in the Union, and there are but few States in which no county associations are held. In many States there are teachers' associations in every county, and when county associations are lacking, their place is sometimes supplied by accessible sectional associations. The number of sectional associations in a State, so far as this was indicated in the returns, varies from two to twelve.

Teachers need not only training schools and official meetings, but they need also to come together of their own free will in professional gatherings. They need to brush up against their fellows, to form acquaintances, and to profit by each other's views as presented in papers.

All these things are heartening, they are enjoyable, and they widen the mental horizon in a variety of ways. The teacher who knows his fellows in other parts of the county, the State, or the nation, has his personality enlarged and is likely to have a more wholesome attitude toward his work. He is richer in experience and his instruction will be more vital and interesting in consequence.

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Teachers too often lead dull lives and their dullness is reflected in their schools. Men and women who must give out as much as teachers do must be often refreshed. They need variety and they need to come in contact with people and places first hand. The pupils in their charge are entitled to more than a formal routine and to secondhand information. They are entitled, in some things at least, to come in contact with the fountain head. This means that the teacher should be broadly acquainted, that he should have direct knowledge of much of what he teaches, and that he should have had some experience in travel. Opportunities in all of these directions are abundantly given by the various teachers' associations.

TEACHERS' READING CIRCLES.

The reading circle idea, according to the Report of the United States Commissioner of Education for the year 1886–87, page 405, appears to have had its origin in a London "society to encourage home study," founded about 1870. A similar society was organized in Massachusetts in 1873, and this was followed in 1878–79 by the Chautauqua Literary and Scientific Circle, which has had a notable career and has numbered many teachers among its members.

State teachers' reading circles appear to owe their beginning to a paper read before the Ohio State teachers' association in 1882, although the honor of priority is disputed by Wisconsin, where a similar plan is said to have been suggested at an earlier date. The Ohio idea was the first to bear fruit, however, and a circle was formed in 1883, which outlined its first course of reading for the year 1883–84.

Indiana followed Ohio closely in organizing a teachers' reading circle. The circle in that State owes its existence to the following resolution adopted at the annual meeting of the State teachers' association in December, 1883:

Resolved, 1. That this association proceed at once to take the necessary steps to inaugurate an organization among the teachers of Indiana for reading and study, to be known as the "Indiana Teachers' Reading Circle."

2. That the circle be under the care and direction of the Indiana State Teachers' Association.

3. That this association proceed to choose a board of directors to which shall be intrusted the selection of a course of professional and literary reading, the issuing of certificates of progress, and the granting of diplomas as evidence of its completion.

4. The board of directors of the Indiana Teachers' Reading Circle shall consist of eight members, selected by the association from its own members, two of whom shall serve for one year, two for two years, two for three years, and two for four years, and hereafter two members shall be elected annually to serve for four years. The board shall elect its officers, arrange its meetings, and record and publish its proceedings.

The first course of reading was adopted for the year 1884–85. By 1888 the reading-circle idea had made such progress and had attracted

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so much attention that the Commissioner of Education gave a survey of the work in his annual report for 1887–88. He sent out letters of inquiry regarding reading circles to the chief school officers of the different States and received replies from 25 States. Of these, 12 reported that they had reading circles and 12 reported that they did not have them. The remaining State, Rhode Island, reported that while it did not technically have a reading circle, the Rhode Island Institute of Instruction discharged the function of one by outlining courses of reading for teachers.

The States that reported affirmatively were California, Illinois, Indiana, Iowa, Kansas, Maryland, Mississippi, New York, North Carolina, Ohio, West Virginia, and Wisconsin. In three of these States, California, New York, and Wisconsin, the circles have since been given up. In fact, they never gained a good foothold in these States and in 1888 were reported as dying.

The present circles in Mississippi and in North Carolina were started, respectively, in 1906 and 1909, which indicates that the circles in those States reported to the Commissioner of Education went out of existence. Indeed, from the meager report given at that time, one might even doubt that North Carolina had a live reading circle in 1888.

From the fact that only 12 States started reading circles in the years intervening between 1882 and 1888, and that the circles in three or four of these soon went out of existence, one might infer that the idea did not appeal to the teachers of the United States. But this inference is contradicted by later developments. At the present time 35 States have State reading circles and 2, Florida and Pennsylvania, have county reading circles, making a total of 37 States.

The data pertaining to reading circles are summarized in Table V. These data were gathered chiefly by means of correspondence with State school officers and reading-circle officers and from reading-circle bulletins. They have been scheduled under six items, as follows: Membership, by whom organized, when organized, management, official connections, and credit for work done.

Twenty-five States reported the membership of their reading circles. This varies from 40 in South Carolina to all the teachers in Kansas. The largest numerical enrollment is found in Ohio, where 11,439 teachers registered for the work in 1907–8.

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TABLE V.—*Reading circles.*

State.	Membership.	Per cent of teachers.	By whom organized.	Date of organization.	Management.	Official connections.	Credit for work.
Alabama	1,600	20	State teachers' association	1909	Board of 7 directors appointed by teachers' association.	State superintendent ex officio member board of directors.	Certificate for 1 year; diploma for 4 years and multiples thereof; teachers' examinations based in part on books read.
Arizona			F. D. Smith and teachers' association.	1909	Committee of 3 appointed by teachers' association.		
Arkansas	2,500	27	State teachers' association	1905	Board of 9	State superintendent ex officio secretary; county examiners ex officio county managers.	Diploma, 4 years; no credit toward teachers' certificates.
Colorado	About 1,100 sets sold	20	do	1905	Board of 2 appointed by teachers' association to act with State superintendent.	State superintendent president of board.	Questions are usually asked in examination to determine whether reading has been done or not.
Connecticut	200 report; more do reading.	4	State teachers' league	1905	Committee of 5 appointed by teachers' league.	Examinations on work given by State board of education.	Work counts toward getting and renewing certificates.
Florida	12	4	Has county reading circles				
Georgia			State teachers' association	[1] 1895	Committee of teachers' association.		
Idaho			State department		State department, county superintendents.	Entirely official; State department issues examination questions.	3 per cent added to certain grades for teachers' certificates.
Illinois	4,500	15	State teachers' association	1885	Board of 9 members	State superintendent chairman of board; county superintendents organize teachers into study classes.	Certificate, 1 year; diploma, 3 years; recognized by county superintendents in renewals.
Indiana	10,000	62	do	1883	Board of 7 members appointed by teachers' association.	State superintendent ex officio member of board.	Grades made in general-culture subjects accepted for county certificates; average of 4 successive years in pedagogy accepted for State certificates.
Iowa	2,000	7	do	1885	Board of 7 directors	State superintendent president and member of board.	Certificate for 1 year; diploma for 4 years; examination questions in part based on books; county superintendent may add 10 per cent to grades for work; renewable certificates renewed for work.

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Kansas	From 3,000 to 6,000	23–46		1885	Board, 1 from each congressional district and State superintendent.	Each contract contains clause of requirement to read adopted books and attend State association; State superintendent president.	Part of examination questions based on books.
Kentucky			State teachers' association	(2)	Board of 7 members elected by teachers' association.		All questions on the art of teaching for county and State certificates based on books adopted.
Louisiana	16 per cent of teachers bought books in 1908.		Reading course established by law as part of parish institutes.	1904	Board of State institute managers outline work.	Entirely official	Salaries sometimes increased for work.
Maryland	820	15	State teachers' association, established by law.	[3] 1888 [4] 1901	Board of 8 members	State superintendent ex officio chairman of board.	Certificate for 1 year granted by board; testimonial for 3 years granted by State board of education; accepted in lieu of professional examination for State certificates.
Michigan			County commissioners and State superintendent.	1889	Board of 5 county commissioners and State superintendent.		50 per cent credit is given on two subjects in third-grade examination. Some questions are based on books.
Minnesota	About 2,000	14		[1] 1895	Board consisting of State superintendent and 6 county superintendents.		Two reading-circle certificates are required for renewal of second-grade certificate and 4 for renewal of first-grade.
Mississippi	50–75		Dr. T. P. Bailey	1906	H. L. Whitfield	(The reading course is for institute conductors.)	Expected for work in institutes and normals.
Missouri	3,000 to 4,000	16–22	State teachers' association	1901	State board and secretary		Questions for teachers' examinations based on books read.
Montana	About 200	10	Maggie V. Smith in a county superintendents' convention.	1902	Committee of 6 appointed by State superintendent.	State superintendent, chairman.	Certificate for 1 year, 2 books; diploma for 3 years, 5 per cent added to general average in examination questions in theory and practice based on books.
Nebraska	5,000	50	State teachers' association	1890	Board of 5 elected by teachers' association.	State superintendent ex officio manager; county superintendent local manager.	Certificate for 1 year; diploma for 4 years: work legally credited toward teachers' certificates.
New Mexico	500	40	Rupert F. Asplund	1908	Rupert F. Asplund		R. C. certificate; 1 point added to general average for each book on which grade of at least 75 has been made; renewal of certificates.

[1] About. [2] Many years ago. [3] Organized. [4] Reorganized.

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TABLE V.—*Reading circles*—Continued.

State.	Membership.	Per cent of teachers.	By whom organized.	Date of organization.	Management.	Official connections.	Credit for work.
North Carolina	About 3,500	33	State Superintendent Joyner as part of teacher-training work.	1909	Supervisor of teachers' training.	Official	Certificate, 1 year; diploma, 4 years; renewal of certificates based on work; examination in theory and practice based on books.
North Dakota	2,000	27	Law enjoins State superintendent to prescribe "the course of reading for the teachers' reading circle."	1890	Board of 6	State superintendent president of board; county superintendent controls county.	Certificate, 1 year; diploma, 3 years; first and second grade certificates renewed; standings of 85 continued on third grade.
Ohio	11,439 (1908)	43	State teachers' association	1883	Board of 9; work outlined in 4-year cycles; county secretary appointed by institute.	State commissioner member board ex officio.	Diploma, 4 years; certificate, 1 year.
Oklahoma	3,500	40			State and county superintendents; board of 4; classes at institutes.	Work outlined by State board of education.	Grades accepted toward State certificate; credit toward county certificates.
Oregon			Law requires State superintendent to prescribe reading.	1910		Work prescribed by State superintendent.	Required for registration of certificates.
Pennsylvania			Has county reading circles				
South Carolina	40		State board of education	1907	Work outlined by State board of education; State superintendent chairman of board; course of 3 years.	Official	Certificates renewed; first-grade certificate extended 10 years for 3 years' work.
South Dakota	2,200	40	State teachers' association	1885	Board of 3 and paid secretary; president teachers' association ex officio president; State superintendent ex officio member.	Legally incorporated; county superintendent manages county.	Certificate, 1 year; diploma, 4 years; credit toward teachers' certificates.
Tennessee	6,000	60	State Superintendent S. A. Mynders.	1906	State superintendent and board appointed by him.	Official	
Texas			State teachers' association	1909	Board of 6 appointed by teachers' association; adopts 3-year course.	City and county superintendents are the local managers.	Certificate, 1 year; diploma for course, 3 years; 6 books.
Utah	2,250	100			State board of education recommends books to be read.	Official	Examinations in professional subjects based on course.
Virginia	4,000	40	State board of examiners	1906–7	State board of examiners outlines reading course.	do	Required for extending certificates.
Washington			State board of education		State board of education	do	Examination questions based on books.

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West Virginia	3,500	40	State superintendent	[1] 1891 [2] 1901	State superintendent; county superintendent local manager.	Legally established; State superintendent directed to outline 2 years' work.	Certificates awarded for course; work considered by examiners.
Wyoming			State board of examiners	1906	Work outlined by State board of examiners; county superintendent local manager.	Official	Certificates extended for work; integral part of certificate requirements.

[1] First law.

[2] Law revised.

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Under "Organization" the table gives the data for 30 States. In 16 of these the reading circles were started by the State teachers' associations, in 4 by the State superintendent, in 2 each by the board of education and by the board of examiners, in 1 by the State superintendent and county commissioners, and in 3 by private persons. For Louisiana and South Dakota it was learned merely that the work has been established by legal enactment.

Reading circles are given legal recognition in 6 States. These are Louisiana, Maryland, North Dakota, Oklahoma, South Dakota, and West Virginia.

LOUISIANA.

The Louisiana law prescribes:

That it shall be the duty of the State institute conductor to formulate the programs for the teachers' institutes and association meetings, and it shall be the duty of the board of institute managers to formulate the State reading course for teachers yearly, and it shall be the duty of the parish superintendent to consult the State institute conductor relative to conducting teachers' institutes, and when conducting teachers' institutes or associations, to follow the programs and the State reading course for teachers so prepared as aforesaid. (S. L., 1910, p. 10.)

MARYLAND.

The members of the State board of education and the members of the county school boards shall encourage the work of the Maryland State teachers' reading circle, which was organized by the Maryland State Teachers' Association and which is a body politic and with power to organize, manage, and direct a State teachers' reading circle. (S. L., 1910, p. 39.)

NORTH DAKOTA.

He [the superintendent of public instruction] shall prescribe the course of instruction for teachers' institutes, and for teachers' training schools, and the course of reading for the teachers' reading circle within the State. (S. L., 1909, p. 20.)

OKLAHOMA.

It shall be the duty of the State board of education—

to formulate and adopt courses of study for State pupils' reading circles, and for State teachers' reading circles, and to select books to be used in said reading circles, and to prepare questions for the issuance of reading-circle certificates. (S. L., 1911.)

SOUTH DAKOTA.

The teachers' reading circle board of managers shall consist of the president of the State educational association, the superintendent of public instruction and a member elected by the county superintendents of the State.

The president of the State teachers' association shall be president of the board and the members of the board shall elect a secretary who shall not be of their number and who shall have no voice in the proceedings of the board. The secretary shall receive such salary as may be fixed by the board, who shall also prescribe his duties. The board of managers of the teachers' reading circle shall hold at least one meeting each year to select the books to be read, and shall have general charge of the teachers' reading circle work in the State. The members of the board of managers shall receive no compensation, but their actual traveling expenses incurred in the discharge of their duties shall be paid from the fees collected for State certificates and life diplomas in the manner hereinbefore provided. (S. L., 1909, p. 7.)

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WEST VIRGINIA.

Teachers shall be encouraged to form reading circles for the purpose of pursuing courses of study in the history of education, school management, methods of teaching, educational psychology, and kindred subjects, and it shall be the duty of the State superintendent to prescribe a graded course of study covering a period of two years in the said subjects, to provide for examining those who complete the said course, and to issue certificates of proficiency to such persons as pass satisfactory examinations thereon. (S. L. 1908, p. 51.)

The years in which reading circles were organized are given for 27 States. In 8 of these they were started before 1890, in 4 from 1890 to 1900, inclusive, and in 16 between 1900 and 1910. This appears to indicate a flow, an ebb, and a flow in the establishment of reading circles, with a decided reaction in their favor in recent years.

The management of reading circles is almost uniformly intrusted to a board or committee appointed by the agency that organized the work or that has it in general charge. The membership of these boards and committees varies, but it appears in no case to be larger than nine. In four States the management is vested primarily in one person. These States are Idaho, Mississippi, New Mexico, and North Carolina.

The official status of the reading-circle work is indicated both by the relation of the State school officers to the management and by the official credit given for the work. Of these, the latter is the more significant. The State superintendent may be given a place on the board of management as a matter of official courtesy or to lend dignity to the work, or both, and the county superintendents are the most convenient persons to designate as local managers. But the credit that is allowed for the work in granting and in renewing teachers' certificates is, and can be, nothing but official.

The reading-circle work is allowed to count explicitly in teachers' examinations or in the granting and renewing of certificates in 27 States. The details are given sufficiently in Table V. In Arkansas, Ohio, Texas, and West Virginia apparently no such credit is given for the work, and the inference is that none is given in Colorado, Georgia, Kansas, Louisiana, and Tennessee.

The certificates and diplomas granted by the management of many of the reading circles are not valid as teachers' licenses, but merely indicate that a certain amount of work has been finished. The work in a number of the circles is laid out in courses of from two to four years in length. Where this is the case the diploma is usually granted for the completion of the course and the certificate for the completion of one year of work.

The number of books adopted annually, according to the bulletins that have been examined, varies from two to eighteen. But an adoption of more than two or three books usually means that the list extends over a period of years and that it is suggestive rather than

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prescriptive. The teachers may annually select and read the two or three books from the list that they prefer. When the books are adopted for the entire course of three or four years, it is also usually the rule that the board changes only two books a year. This means that those longest on the list are dropped and that new ones are adopted in their stead.

In pursuing the reading, the teachers are given much intelligent guidance. Outlines of and suggestive questions on the books are frequently published in the reading-circle bulletins and sometimes in the institute or teachers' meeting bulletins, as was noted for Indiana and Louisiana on pages 69 and 72 above. Frequently, also, the State educational papers cooperate and publish in their columns outlines, questions, and discussions on the reading-circle books.

The manner in which the reading-circle work is conducted varies in different places. In some States, as for example Indiana, Louisiana, and South Dakota, regular class work is conducted at the township, parish, and county teachers' meetings; in other States a part of the time of the annual institute is devoted to the work; in still others the teachers arrange themselves in small groups and meet periodically to discuss the books; and not infrequently the teachers do the reading solely by themselves.

Additional light on the way the work is conducted is thrown by the following extracts from current bulletins:

A plan which has proved successful in some localities is to organize a local teachers' reading circle. Six or eight teachers in adjoining districts constitute this circle, and select one member each time to conduct the recitation. The place of meeting may be changed from one district to another for the convenience of the teachers. Another plan is to take up the work at the county associations. Have the program of each meeting based on the reading circle books and thoroughly discussed. (Oklahoma, 1908–9.)

The county organization will not work well in the reading circle. Hence it is much better if the county is districted so as to include only a few teachers in each district, preferably not more than one dozen. There should be a local director whose business should be to take charge of the class and conduct the work in such a way as will be to the best interests of the teachers. These meetings should be held at least once each month. In the counties where this was done the past year, the work was more successful. (Arkansas, 1910–11.)

There should be a reading circle established in every village, town, and city school in the State. Let the rural teachers meet with the teachers in the village and town schools when convenient. But some rural teachers will find it impossible to meet with the sections in the towns and villages. Therefore we recommend the use of questions to be sent out by the county superintendents, on which a written review may be made once a month on the work for the month, or a general test on each book at the close of the year. Then two or three times during the year the rural teachers should be asked for papers on some professional topic treated of in the prescribed course. The same care should be demanded in the preparation of this paper that the teacher would make in writing a production to be read before a teachers' association. Teachers should be given the privilege of consulting books of the course or any other book that will give them information in the preparation of their papers. The papers thus prepared should

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be graded with the same care as that exercised in grading any examination papers. This means work for both teacher and superintendent. It likewise means intellectual and professional growth for both. (Nebraska, 1910.)

The nature and variety of the books read in any one circle are illustrated by the following sample adoptions selected from recent bulletins.

Books used in reading circles.

Illinois, 1910–11.

Allen's Civics and health.
Ham's Mind and hand.

Iowa, 1910–11.

Professional book: Dinsmore's Teaching a district school.
Culture book: Allen's Civics and health.
The handbook for Iowa schools (issued by the State department).
Two or more good educational journals.

Maryland, 1909–10.

Pedagogy: Bagley's Educative process.
History: McMurry's Special method in history.
Science: Allen's Civics and health.
English: Heydrick's How to study literature.

North Carolina, 1909–10.

Hamilton's Recitation.
Dinsmore's Teaching a district school.
McMurry's Special method in reading.
Irving's Sketch book; Tennyson's Idylls of the king.
Bulletins: How to teach reading; Outline course of study.
North Carolina education.

Washington, 1910–11.

Bagley's Classroom management.
Swift's Mind in the making.
Farnsworth's Education through music.
Briggs and Coffman's Reading in the public schools.
Gordy's New psychology.

A composite picture of the books read in reading circles is given by the following lists. These lists give the books adopted during three periods, together with the number of times each was adopted. The first list includes the books adopted from 1883–1888 and is compiled from the account of reading circles in the Report of the United States Commissioner of Education for 1887–88, pages 1050–1074. The second list includes the books adopted from 1905–1908; and the third those from 1909–1911. Both of these lists are compiled from a variety of recent sources.

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Reading-circle books for 1882–1888.

	Times adopted.
Agassiz: First lessons in natural history	1
Barnes: General history	7
Bain: Education as a science	1
Brown: Physiology	1
Brooks: Mental science	2
Burke: Speeches on America	1
Calderwood: Teaching	2
Chandler: History and civil government of Iowa	1
Chapin: First principles of political economy	2
Chaucer: Prologue to Canterbury tales	1
Coleridge: Ancient mariner	1
Compayre: Lectures on teaching	1
Compayre: History of pedagogy	2
Crosby: Common minerals and rocks	1
Currie: Common school education	1
Dickens: David Copperfield	1
Duval: History of Mississippi	1
Earle: Philology of the English tongue	1
Eliot: Romola	1
Fisher: Outlines of universal history	1
Fitch: Lectures on teaching	1
Goldsmith: Deserted village	1
Goodale: Common plants	1
Gow: Morals and manners	1
Green: History of the English people	2
Gregory: Political economy	3
Hailmann: Lectures on education	1
Hailmann: History of pedagogy	1
Hale: Lights of two centuries	1
Hawthorne: Tales of a grandfather	1
Hewett: Pedagogy	3
Homer: Odyssey (translation)	1
Hopkins: Outline study of man	1
Hunt: Physiology and hygiene	3
Hyatt: About pebbles	1
Hyatt: Commercial and other sponges	1
Hyatt: Hydroids and coral	1
Irving: History of New York	1
Irving: Sketch book	2
Irving: Washington and his country	2
Krusi: Pestalozzi	1
Kiddle: How to teach	1
Kingsley: Westward, Ho!	1
Longfellow: Evangeline	1
Macaulay: Essay on Warren Hastings	1
Macy: Our Government	1
Marsh: The earth as modified by human action	1
Meiklejohn: English language	1
Mombert: Great lives	1
Nordhoff: Politics for young Americans	1
Oliphant: Makers of Florence	1
Page: Theory and practice of teaching	3
Painter: History of education	1
Parker: Talks on teaching	3

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	Times adopted.
Payne: Lectures on education	3
Payne: Science of education	1
Pestalozzi: Leonard and Gertrude	1
Plutarch: Selected lives	1
Pope: Essay on man	1
Prince: Courses and methods	1
Pryde: Highways of literature	1
Quick: Educational reformers	1
Richards: First lessons in minerals	1
Richardson: American literature	1
Rousseau: Émile	1
Ruskin: Sesame and lilies	1
Scott: Lady of the lake	2
Scott: Ivanhoe	1
Shakespeare: Julius Caesar	2
Shakespeare: Henry IV	1
Shakespeare: Merchant of Venice; Macbeth; Tempest	1
Smith: English literature	1
Steele: Political economy	1
Stewart: Primer of physics	2
Swett: Methods of teaching	1
Swinton: Outlines of world history	1
Swinton: Classical English reader	1
Tennyson: Princess	1
Thackeray: Henry Esmond	1
Thalheimer: English history	1
Trench: The study of words	1
Wallace: Ben Hur	1
Watts: Improvement of the mind	3
White: Elements of pedagogy	2
Whitney: Life and growth of language	1
Wood: Natural history	1

Reading-circle books for 1904–1908.

Adler: Moral instruction of children	1
Bagley: Classroom management	2
Bailey: The nature study idea	1
Baldwin: Industrial and social education	1
Barrett: Practical pedagogy	1
Bigelow: How nature study should be taught	1
Blackmar: Elements of sociology	1
Blanchan: Birds every child should know	2
Bowen: Astronomy by observation	1
Briggs and Coffman: Reading in the public school	1
Brigham: Geographic influences in American history	2
Bryan: Basis of practical teaching	1
Bryant: How to tell stories to children	4
Burrage and Bailey: School sanitation and decoration	3
Butler: The meaning of education	1
Chubb: The teaching of English	6
Clark: How to teach reading	1
Colly: Literature and life in the school	1
Conn: Evolution of to-day	1

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	Times adopted.
Cox: Literature in the common schools	1
De Garmo: Essentials of method	1
Dewey: The school and society	1
Dopp: Industries in elementary education	1
Dutton: School management	3
Dutton: Social phases of education	1
Eliot: Educational reform	1
Froebel: Education of man	1
Fiske: Civil government in the United States	1
Gilbert: The school and its life	3
Griggs: Moral education	2
Hall: Youth	1
Hamilton: The recitation	6
Hanus: Educational aims and values	1
Hart: Source book of American history	1
Hatch and Hazelwood: Elementary agriculture	1
Heilprin: The earth and its story	1
Henderson: Social spirit in America	1
Henderson: Education and the higher life	1
Hinsdale: Art of study	1
Hinsdale: American government	1
Hodge: Nature study and life	1
Holton and Rolins: Industrial work in public schools	1
Horne: Philosophy of education	1
Huntington: Unconscious tuition	1
James: Talks to teachers	2
James: Practical agriculture	1
Johnson: Mathematical geography	2
Jordan and Kellogg: Evolution and animal life	1
Judd: Genetic psychology for teachers	1
Keith: Elementary education	2
Kemp: History of education	1
Kern: Among country schools	6
King: Rational living	1
Lockwood: The new harmony movement	1
Macaulay: Life of Johnson	1
Mace: Method in history	1
Marsh: Point of view of modern education	1
Metcalfe: Of such is the kingdom	1
McLellan and Dewey: Psychology of number	1
McMurry: Method of reading the English classics	1
McMurry: Method of the recitation	3
McMurry: General method	1
McMurry: Special method in geography	1
Moran: Theory of the English government	1
Murphy: Turning points in teaching	1
Newcomer: American literature	1
Nivers: English history	1
Noyes: The gate of appreciation	1
Oppenheim: Development of the child	1
O'Shea: Dynamic factors in education	1
Page: Chief American poets	1
Painter: Introduction to American literature	2

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	Times adopted.
Painter: History of education	1
Parkman: La Salle	1
Payne: Elementary school curricula	1
Perry: Management of a city school	1
Prince: Method in teaching	1
Proctor: Half hours with the stars	1
Putnam: Psychology	1
Putnam: Representative essays	1
Roark: Method in education	1
Rowe: Physical nature of the child	1
Sabin: Common sense didactics	2
Seeley: New school management	1
Seeley: History of education	1
Semple: American history and its geographic conditions	3
Sherman: Elements of literature and composition	1
Sherman and Reed: Essentials of teaching reading	2
Smith: The teaching of elementary mathematics	1
Soule and Turpin: Agriculture	1
Sparks: The men who made the nation	1
Swett: American public schools	1
Swett: Methods of teaching	1
Thorndike: Principles of teaching	2
Titchener: Primer of psychology	1
Van Dyke: Essays in application	2
Vincent: American literary masters	2
White: The art of teaching	1
White: Two years in number	1
White: Elements of pedagogy	3
Willey: The formation of West Virginia	1
Winterburn: Stockton methods in elementary schools	1
Wright: The citizen bird	1
Educational foundations	1
History of education in West Virginia	2
Masterpieces of American literature	1
Methods in ten cities	1
Poems for the study of language	1
Revised course of study, Illinois	1
State course of study, Louisiana	1
The little school mistress	1
When first we go to school	1

Reading-circle books for 1909–1911.

Allen: Civics and health	18
Bagley: Classroom management	4
Bagley: Educative process	2
Baldwin: Six centuries of English poetry	1
Barbe: Famous poems explained	1
Barrett: Practical pedagogy	1
Boyer: Modern methods for teachers	1
Briggs and Coffman: Reading in public schools	4
Bronson: American literature	1
Brooks: English literature	1
Burrage and Bailey: School sanitation and decoration	1

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	Times adopted.
Chamberlain: Standards in education	4
Chubb: Stories of authors	1
Chubb: Teaching of English	3
Coman: Industrial history	1
Compayre: Lectures on pedagogy	1
Coulter: Nature study and agriculture	1
Cox: Literature in the common school	2
Cummings: Nature study for primary grades	1
Davenport: Education for efficiency	1
Dewey: How we think	1
Dewey: Moral principles in education	1
Dinsmore: Teaching a district school	7
Dutton: School management	1
Earhart: Teaching children to study	2
Eliot: Education for efficiency	1
Emerson: Education	1
Farnsworth: Education through music	1
Ferguson and Lewis: Elementary principles of agriculture	1
Fess: Political theory and party organization	1
Fisher and Cotton: Agriculture for common schools	1
Fiske: The meaning of infancy	1
Gilbert: The school and its life	2
Gordy: New Psychology	1
Gulick: The efficient life	2
Ham: Mind and hand	1
Hamilton: The recitation	5
Hart: Essentials of American history	1
Heydrick: How to study literature	1
Hinsdale: Teaching the language arts	1
Hodge: Nature study and life	2
Horne: Philosophy of education	2
Hughes: The teaching of citizenship	2
Hyde: The teacher's philosophy	1
Irving: Sketch book	1
Johnson: Education by plays and games	1
Kern: Among country schools	2
MacClintock: Literature in the elementary school	1
McKeever: Psychological method of teaching	2
McMurry: How to study	7
McMurry: Special method in reading	1
McMurry: Special method in history	1
Monroe: Brief course in the history of education	3
Monroe: Grammar and its reasons	2
Moulton: The literature of the Bible	1
Murphy: Turning points in teaching	1
Myers: General history	1
Palmer: Ethical and moral instruction in schools	1
Palmer: Self-cultivation in English	2
Phillips: Old tales and modern ideals	1
Putnam: Psychology	1
Quinn: The art reader	1
Ritchie: Primer of sanitation	1
Salisbury: The theory of teaching	1

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	Times adopted.
Schaeffer: Thinking and learning to think	1
Scott: Social education	1
Seeley: History of education	1
Semple: American history and its geographic conditions	1
Shakespeare: As you like it	1
Shakespeare: Henry V	1
Sherman and Reed: Essentials of teaching reading	1
Smith: The evolution of Dodd	4
Swift: Mind in the making	2
Tennyson: Idylls of the king	1
Thoreau, *et al:* In American fields and forests	1
Van Dyke: Essays on application	2
Warren: Elements of agriculture	3
Watkins: American literature	1
Wilkinson: Practical agriculture	1
Wilson: Picture study in elementary schools	1
Bulletins, North Carolina:	
How to teach reading	1
Outline course of study	1
Handbook for Iowa teachers	1
New Elementary agriculture	1
North Carolina education	1

A comparison of these lists indicates a distinct tendency in the nature of the books adopted since reading circles were first started. The percentage of professional books, including in this term books on education and psychology, adopted in recent years has been much higher than it was in the eighties. In the list for 1882–1888, only about 33 per cent of the titles can be classified as narrowly professional, while in each of the other lists slightly over 70 per cent must be so classified. This may be accounted for on two grounds. It indicates, in the first place, that teachers now come to their work with better academic preparation than they did formerly, and, in the second place, that the professional side of the teachers' preparation is being more adequately recognized.

The reading circle, like the institute, reaches many more rural than city school teachers. But city-school teachers are by no means left untouched by it. In Indiana, Ohio, and West Virginia the teachers in cities participate quite generally in the State reading-circle work, the books being generally discussed at the teachers' meetings, and the same is no doubt true in other States.

Miss Shipp, in her study on elementary supervision, found that 13 out of the 39 cities studied had reading circles for teachers.

The amount of systematic professional reading that is done in cities is difficult to determine. Even when such work is done, the fact is not always recorded in the superintendents' reports, for in many places it is regarded as an established part of the monthly or weekly teachers' meetings that needs no comment. In a few places, illus-

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trated by Calumet, Mich., the superintendent is directed by the rules and regulations of the board of education to lay out courses of professional reading for the teachers and to require such tests as he may deem proper. The merit system for the promotion of teachers also usually requires the systematic study of educational literature by teachers.

Voluntary study classes should be grouped with reading circles, and these exist in many cities. As instances may be mentioned Wilmington, Del.; Evansville, Ind.; Pittsburg, Pa.; Westerly, R. I.; Memphis, Tenn.; and Salt Lake City, Utah. The principals, too, not infrequently study and systematically discuss educational literature at their meetings. This is done, for example, at Decatur, Ill.; Indianapolis, Ind.; Winona, Minn.; and Wheeling, W. Va.

FUNCTION OF READING CIRCLES.

That the reading circle forms one of the most effective agencies for the growth of teachers in service needs no extended argument. It is no exaggeration to say that thousands of teachers read good professional and cultural books through reading circles who would otherwise either not read such books at all or read them to a far less extent. The circle furnishes the necessary stimulus for the reading, and through the social factor that it usually involves it helps to make this reading pleasant. Many teachers who have had little or no training-school advantages get the major part of their theoretical professional insight through the reading-circle books, and many others are assisted in keeping abreast of educational thought by this means.

The way in which reading circles are usually managed is well calculated to keep teachers abreast. Even when the same topics are repeated after a cycle of three or four years, this is done by different books which are likely to record any advances that will have been made. This enables a teacher to follow the reading-circle work with profit continuously throughout his career.

A difficulty is met, however, in the fact that the teachers in any county or community are at different levels of preparation. The books that are suited to a high-school graduate are not always suited to a normal or college graduate, or to a teacher of long experience. But as the books adopted by reading-circle boards are usually meant for rural-school teachers, and as these teachers are usually young and inexperienced, the teachers with considerable experience or with more adequate preparatory training do not always take kindly to the reading-circle work. This is unfortunate, and measures should be taken to avoid it. Several lists of books might be adopted and the teachers given wider, although regulated, options.

But some of the trouble that confronts us here lies with the trained teachers themselves. Normal graduates, for example, not infre-

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quently feel that they have graduated in their professional training and that all that should be expected of them henceforth is to teach. They chafe under anything that savors of further systematic study. Probably nothing but time will cure some of them of this, but the majority could no doubt be given a different spirit by the normal-school faculties and later by the superintendents under whose charge they fall. They should be led to realize that teaching is a rapidly growing profession and that they have but barely crossed the threshold in entering it.

PUPILS' READING CIRCLES.

With but few exceptions, the States that have teachers' reading circles also have pupils' or young peoples' reading circles. These are controlled by the same board as the former, having, however, separate managers in a few instances. They have not been included in this study because they are too remote from the problem of the aftertraining of teachers. But that they do touch this problem is made clear by the following words of L. H. Jones, for six years a member of the board of directors of the Indiana young peoples' reading circle:

> I am not in general an advocate of the policy of indirection; but there are some things that seem more easy of accomplishment when the end to be obtained is not kept too closely in the consciousness of the one in whom the purpose is to be realized. It is in this view of the case that I have watched with great interest the effect upon the teachers of Indiana of the young peoples' reading circle. * * * Pupils of the ordinary school have been roughly cast into five grades, and from two or three books assigned to each of these grades for a year. The teachers of the State were asked through circulars to become the agents of the board of directors in securing the interest of the children and parents, and they were especially asked to make use of the books on this list as supplementary to the work of the textbooks in school. The township trustees were asked to buy from the public fund a set of books each year for the library for each school district. A system of district libraries of the best reading for young people has thus been established in more than half of the counties of that State. It is in connection with the use of these books in the schoolroom that a point of the greatest interest to me has risen. In order to be able to use these books to supplement school work, and in order to be able to direct the children in the reading of these books in their homes, and in order to interest the trustees in the purchase of these books for the libraries, the teachers have been obliged to read the books for themselves, and, strangely enough, through this reading of the books—at first compulsory, afterwards with ever an increasing interest voluntarily—such interest in juvenile literature has been established that I verily believe the young peoples' reading circle has done more to arouse enthusiasm and develop power among the teachers of Indiana than the teachers' reading circle itself has accomplished; for the books selected for the young peoples' reading circle were almost in every case those universal books touching all ages, temperaments, and interests. Such books can be written only by geniuses. The teachers became at once interested in a line of reading of which they had known nothing, a new bond of sympathy between them and the children was established, and themes of conversation above the commonplace were suggested by the mutual reading of these books. (N. E. A., 1895, pp. 181-182.)

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PRINTED AIDS.

The practice of assisting teachers through printed directions and pamphlets is common throughout the country, and it is so vast in extent that it can only be touched upon here by the mention of a few illustrative examples.

The institute manuals referred to above frequently contain much more than programs for and outlines of the institute work. Some of them are planned to be of assistance to the teacher and the pupils throughout the year. The West Virginia manual for 1910, for example, is a book of 141 pages and contains the following topics: An outline of the institute work, together with the program for each day's session, 39 pages; a discussion of art and kindred subjects in the schoolroom, together with many practical suggestions, 22 pages; memory gems, 9 pages; Scripture readings, 8 pages; songs appropriate for the school and the home, 40 pages; and an educational and political directory of the State, 14 pages. The manual is in addition handsomely illustrated with reproductions of works of art and other pictures of educational value.

Illinois issues an illustrated pamphlet prepared by U. J. Hoffman on "The One-Room Country Schools in Illinois" that is especially helpful on the administrative side. The pamphlet contains 92 pages and discusses the following topics: The schoolhouse; State inspection; suggestions to boards of directors; organization and devices; and the teacher and his work.

"How to Have a Good School" is the title of a 30-page pamphlet prepared and issued by State Supt. C. P. Cary, of Wisconsin. This pamphlet is meant especially for beginning teachers in rural schools, but all teachers could well profit by it. It discusses such topics as the teacher; organization and discipline; rules and punishment; rewards; the recitation; ends in teaching; and the most important things.

"How to Teach Reading" is the title of a pamphlet issued by the State educational department of North Carolina. The pamphlet contains 41 pages and was prepared by Supt. Charles L. Coon, of the Wilson (North Carolina) public schools. It is meant especially for teaching beginners to read and is now included in the adopted list of the State teachers' reading circle.

A wealth of pedagogical assistance is contained in the courses of study issued by the various States. All rural teachers at least are usually furnished copies of these courses and they are in a measure obliged to follow them. This means that they have to study them and assimilate their suggestions.

The annual reports and courses of study prepared by city superintendents are often richer in pedagogical suggestions than those issued by the State departments. In the larger cities these courses are some-

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times published separately for the different subjects and so form veritable little handbooks for teachers. Indeed, so much of a pedagogical nature is included in them in some places that the course-of-study feature sinks to a secondary position and they become primarily handbooks of method. This is well illustrated by Indianapolis, as is indicated by the following words from Supt. Calvin N. Kendall's report for 1908–9, page 80.

> We have pamphlets, or courses of study, bearing upon the following subjects: Reading, spelling, English, geography and history, mathematics, music, physical training, sewing, physiology and hygiene, supplementary games for the first and second grades, and an outline entitled, "Outline for the Course of Study in the Elementary Grades."
>
> These pamphlets not only outline the course of study, but each of them presents in some detail the best current thought about the teaching of the particular subject it treats. The purpose is not to restrict the teacher's originality, but rather to give her a larger view. These pamphlets have been prepared by teachers, directors, supervising principals, assistant superintendents, and the superintendent. If printed in one book they would make a volume of 1,000 pages. * * * These pamphlets are called for constantly from every part of the country. The demand became so great that it was necessary to secure the approval of the board to make a charge when they were sent out, the proceeds of which were turned over to the board.

While the handbooks issued by Indianapolis are the most pretentious that are found in this country, pamphlets of a similar nature are issued also by Chicago, Baltimore, New York, Rochester (N. Y.), St. Louis, Washington, and other cities.

CERTIFICATION OF TEACHERS.

The granting and the renewal of certificates form a ready and convenient means for inducing professional growth on the part of teachers. The fact that the higher certificates are good for a longer term time than the lower ones forms such an inducement. It is unpleasant to prepare for examination every year or two, and therefore it is worth while to extend one's studies so as to get a certificate that is good for a longer term of years or for life. Indeed, in a number of the States teachers are compelled to prepare themselves for higher certificates because third-grade certificates are issued only once or twice to the same person. In Oregon both second and third grade certificates are issued only once to the same person unless his experience is insufficient for a higher certificate, while in Kentucky and Nebraska the third-grade certificate is not reissued at all. In Iowa, Montana, and Oklahoma the third-grade certificate is granted only twice to the same person, and in West Virginia only twice in succession. This certificate is good for one year.

The manner in which the renewal of certificates is used to induce professional study is illustrated by the following instances:

In Arkansas the third-grade certificate may be renewed once, the second-grade twice, and the professional license indefinitely for attendance upon the "summer institutes."

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In Iowa the first and second-grade certificates are renewed without examination on the successful completion of one line of professional study.

In order that the county professional certificate may be renewed in Kansas the teacher must have had no nonteaching period of more than two years; must have attended 90 per cent of the sessions of the county institute; must be a regular and active member of the county teachers' association; must be a subscriber to an educational journal; and must do such other professional work as the State or county superintendent may direct.

In Louisiana first, second, and third-grade certificates may be extended one year for attending a State summer normal nine weeks.

In Missouri the third-grade certificate may be renewed once, the second-grade twice, and the first-grade an unlimited number of times, provided the holder has taught four months in two years previous, or has made a satisfactory record in an approved summer school.

In New York the academic certificate may be extended one year for each 18 counts earned in examination toward a life certificate while the certificate is in force. The elementary certificate may be similarly extended for each eight counts of academic work completed while in force.

One of the conditions for renewing the first-grade certificate in Oklahoma is attendance upon 75 per cent of the sessions of institutes.

In South Carolina the first and second-grade certificates may be renewed if the holder has attended an institute or summer school.

In South Dakota the State certificate, first-grade certificate, and primary certificate are renewed for successful experience and full attendance at the county institute during the current year.

In Tennessee certain certificates are renewed for successful teaching and keeping up the reading-circle work, while others are renewed for 15 days' institute attendance.

In Texas the first and second-grade certificates are renewed if the holder has attended the county institute each year and a summer normal institute each alternative year, has averaged 75 per cent, and has taught each year.

In Virginia a number of certificates are renewed, provided the teacher has been successful and has done the work of the reading course.

In Utah and Washington certain certificates are renewed for the successful pursuit of a stipulated amount of work at higher institutions.

In Wisconsin the second-grade certificate may be renewed if the holder has taught two years and has attended a professional school six weeks, receiving credit in two subjects. The third-grade certificate may be renewed not more than three times, (1) if the holder has

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attended a professional school for six weeks, or (2) if satisfactory standings have been secured in two additional subjects required for the second-grade certificate.

In Wyoming a number of certificates are renewed on the completion of the reading-circle course.[1]

SABBATICAL YEARS.

The custom of granting teachers a year's leave of absence from time to time for the purposes of study, travel, and rest is gradually becoming established in our larger colleges and universities, but it has as yet scarcely gained a foothold in our high and elementary schools. While a number of superintendents have discussed the practice favorably in their annual reports, only three cities have adopted it. These are Cambridge, Boston, and Newton, Mass. Cambridge grants a year's leave of absence with one-third pay after ten years of service, and Boston and Newton each grant a year with half pay after seven years of service. These are for study or travel. Boston grants one year in twenty-one also for rest. The words of the official regulations follow.

CAMBRIDGE.

Any teacher who has served in the city for ten years may, on recommendation of the superintendent and vote of the board, have leave of absence for one year for purposes of study or travel, and may receive one-third of his salary. (R. & R., 1899, p. 14.)

BOSTON.

Sec. 317. 1. Applications for leave of absence for study and travel shall be for a period not exceeding one year, shall state the definite purpose for which such leave of absence is desired, and, if recommended by the superintendent, shall be submitted by him to the board for approval.

2. A member of the supervising staff or teacher receiving leave of absence to study and travel must have completed seven years of service in the public schools of the city of Boston, part of which may be in the parental school. He may be granted such leave of absence more than once, but not to exceed one year in any eight consecutive years. A member of the supervising staff or teacher receiving leave of absence for rest must have completed twenty years of service in the public schools of the city of Boston, part of which may be in the parental school. He may be granted such leave of absence more than once, but not to exceed one year in any twenty-one consecutive years.

3. The teacher shall make to the superintendent at such times and in such form as the latter may specify reports as to the manner in which the leave of absence is employed; and for failure on the part of the teacher to comply with any requirements of this section, or to pursue in a satisfactory manner the purpose for which the leave of absence was granted, such leave of absence may be terminated by the superintendent at any time.

[1] For a complete summary of the renewal and other conditions of certificates, the reader is referred to "Teachers' Certificates Issued under General State Laws and Regulations," by Harlan Updegraff, issued by the United States Bureau of Education.

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4. The teacher shall file with the secretary of the board an agreement in writing, binding the teacher to remain in the service of the board for three years after the expiration of such leave of absence, or, in case of resignation within said three years, to refund to the board such proportion of the amount paid him for the time included in the leave of absence as the unexpired portion of said three years may be to the entire three years. The provisions of this agreement shall not apply to resignation on account of ill health, with the consent of the board, nor to resignation at the request of the board. (R. & R., 1908, p. 67.)

NEWTON.

Any teacher who has served continuously in the Newton schools for a period of not less than seven years may, on the recommendation of the superintendent, be granted leave of absence not exceeding one year. During such absence the teacher shall continue in the employment of the school department and shall receive a monthly salary equal to one-half his or her monthly salary of the preceding year. A teacher's leave of absence shall be spent largely or wholly in study, such study to be undertaken with the advice of the superintendent and carried on in such institutions or in such places and under such teachers as the superintendent may approve.

As a condition of receiving such leave of absence, the teacher shall enter into a contract to continue in the service of the school department for a period of at least three years after the expiration of the leave of absence; failing so to continue in the service of the school department, the teacher shall repay to said department a sum bearing the same ratio to the amount of salary received while on leave of absence that the unfulfilled portion of the three subsequent years' service bears to the full three years.

Provided, however, that the teacher shall be released from such repayment if her failure to serve the three years, as stipulated, be due to her illness, or if she be discharged or voluntarily released from her position by the school department.

SPECIAL FUNDS.

Funds, the incomes from which are devoted to the improvement of teachers in service, exist in Indianapolis, Ind., and Pittsburg, Pa.

INDIANAPOLIS.

The two funds used for the improvement of teachers in service in Indianapolis are described as follows in the annual report of the public schools for 1908–9.

THE GREGG BEQUEST.

In 1879 the board of school commissioners came into possession of a part of the estate of Thomas D. Gregg, who at one time was a teacher in the Indianapolis public schools. * * *

The fund now amounts to $37,000, the income of which is at present about $2,100 a year. Five hundred dollars of the income is now added each year to the principal of the fund.

Since the fund was established, upwards of 150 teachers have received its benefits. These teachers usually attend summer schools. Several have received half-year scholarships at various universities. Two recipients of the fund went to Germany for study there.

Only by means of the fund were some of these teachers able to continue their studies. In almost every instance the recipients have returned to the schools with added

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power and renewed enthusiasm. Many recipients of the fund have become leaders in the activities of the schools.

During the past three years a part of the income has been used to pay for lectures before the entire teaching body of the city.

McCOY FUND.

In 1896 the board came into possession of $1,500 as a bequest of the late William T. McCoy, who was at one time a colored teacher in the Indianapolis schools. By the provisions of the bequest, the income of this fund is to be used for the benefit of the colored schools of the city. Only a part of the income has thus far been used, chiefly for scholarships in summer schools, for the purchase of lantern slides for exhibiting the work of colored schools, and for the purchase of tools for gardening.

The Indianapolis schools have the benefit also of three additional funds, but as their incomes are devoted to other purposes than the improvement of teachers, they need not be described here.

PITTSBURG.

A fund of $250,000 was intrusted to Dr. John A. Brashear in the fall of 1909 by an anonymous giver, to be used at his discretion to *promote the efficiency of the schools*. Dr. Brashear has asked six other prominent citizens of Pittsburg to serve with him on a commission to administer this fund. After seeking the advice of the teachers of Pittsburg and elsewhere, this commission decided to use the income of the fund in 1910 to give scholarships to 70 teachers at summer schools in recognized colleges and universities of the United States.

The 70 teachers were selected in a manner that is worth noting. In March, 1910, according to the Pittsburg School Bulletin for June, 1910, the commission sent about 1,800 individually addressed letters to the teachers of Pittsburg, asking them to give suggestions for the disposition of the fund. Only about 5 per cent of the teachers deemed it worth while to answer this letter, and the commission decided to reward, as far as possible, this 5 per cent by granting them the scholarships for this year.

SCHMIDLAPP FUND.

In this connection brief mention may be made also of the Schmidlapp fund of Cincinnati, whose benefits may be enjoyed by women teachers, among other young women, of Cincinnati and vicinity, although the fund does not exist primarily for the improvement of teachers in service.

The available income of this fund is now $3,000, and its purpose is thus described in the trust agreement:

The net income derived from said property, as herein provided, or any contribution thereto by said Jacob G. Schmidlapp, shall be used in aiding young girls in the preparation for womanhood, by bringing their minds and hearts under the influence of education, relieving their bodies from disease, suffering, or constraint, and assisting them to establish themselves in life.

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KAHN FUND.

America has recently been made the beneficiary of the Kahn Foundation for Foreign Travel of American Teachers. This foundation has been established in New York (71 Broadway) by Edward D. Adams, the representative of Mr. Albert Kahn, of Paris, and its benefits are to go primarily to college and university teachers. Similar foundations have been established by Mr. Kahn in France, Germany, Russia, England, and Japan.

THE MERIT SYSTEM OF PROMOTION.

The primary basis for the promotion of teachers, both in salary and position, in American cities has in the past been, and virtually still is, length of service. In accepting this basis it has no doubt been assumed that teaching efficiency in a large measure keeps pace with length of service, but the humanitarian motive of rewarding ripeness in years and of recognizing family and other responsibilities that years usually bring has also entered.

In recent years, however, some form of a merit system of promotion has been adopted in many cities. It is not unusual now to find provisions such as the following in the rules and regulations of boards of education: "Promotion or increase of salary shall be solely on the ground of merit," or "The salary shall be increased $50 annually until the maximum is reached if the work is entirely satisfactory."

In ascertaining the merit of teachers, two bases are used, namely, (1) classroom efficiency and (2) growth in professional knowledge as measured by promotional examinations. The first is often used as a basis of promotion without the second, but the second appears never to be used without the first. The interrelation of the two is obvious, and when the first is used without explicit reference to the second, such reference is no doubt made implicitly.

Length of service as one factor in promotion is never entirely omitted, either with classroom efficiency alone, or with classroom efficiency and promotional examinations combined. On the contrary, it is usually given explicit consideration.

PROMOTIONAL EXAMINATIONS.

Promotional examinations are now used in Baltimore, Md.; Boston, Mass.; Chicago, Ill.; Cincinnati, Ohio; Kansas City, Mo.; Lincoln, Nebr.; New York, N. Y.; Paterson, N. J.; Saginaw, Mich.; Springfield, Ohio; and Washington, D. C. The official regulations governing these examinations are indicated in the following pages.

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BALTIMORE.

PROMOTIONAL EXAMINATION.

PART 1. ENGLISH.

The rule for the first advance of teachers' salaries beyond $504 (Promotional Examination, Part I) prescribes as one requirement "an impersonal test in the correct and effective use and interpretation of English." It is a well-known fact that many students secure a satisfactory general average of scholarship at graduation from the high school, when their equipment and power in English are not at that time entirely adequate to a teacher's needs; yet such graduates frequently develop afterwards into very good teachers. All candidates for the first promotion in the teaching service should be able to show that they have attained that sound judgment and refined taste in English which is the outcome of wider reading and study and greater maturity of mind than can be expected of high-school students. The examination in English, therefore, is set for the purpose of ascertaining (1) whether the teacher's own hold upon English is satisfactory, and (2) whether the teacher is in possession of some good aims and methods for the instruction of children in English composition and literature.

A teacher should be able to speak and write English with absolute correctness, and also to interpret correctly any ordinary piece of classic prose or poetry This requirement, though, is not extensive enough; for in fact quite meager attainments suffice to make one simply correct in the use and understanding of English. Many persons speak and write in a way that is not incorrect, but their English is decidedly ineffective. Mere correctness in English is not enough to insure success in teaching.

To succeed in the classroom one's words must be effective; and effective English does not come unsought. For the production of effective English the teacher needs all the art that can be mustered. Similarly, the teacher must be able not only to understand classic literature but also to interpret it effectively to children; and expertness in interpretation can be secured only by systematic study.

As it is necessary for the teacher to have this effective command of English, the candidate for promotion is expected to show that he has, since his high-school and normal-school graduation, made reasonable advance in analytic and constructive power and in strength and maturity of style. Particular texts for reading and study are named below merely in order to limit the examination questions to certain good books, so that those teachers who care to make any direct preparation for the examination may know just what classics to review.

In preparing Promotional Examination, Part I, this year, the examiners will base their questions upon the following texts:

For careful study:

Questions will be offered upon all the texts, but answers will be required on three only.

Shakespeare, Twelfth Night, Macbeth; Browning, Selected poems [the selection in Ginn's Standard English Classics]; Lamb, Essays of Elia [selected from the edition in Macmillan's Pocket classics]; Macaulay, Essay on Milton; Dickens, David Copperfield, Tale of two cities; George Eliot, Silas Marner; Hawthorne, House of seven gables; Churchill, Coniston.

For general reading:

Questions will be offered upon all the texts. Answers will be required upon one poetical text and two prose texts.

Milton, Paradise Lost, I and II; Scott, Marmion; Byron, Childe Harold, IV, etc. [Riverside Literature Series, 189]; Tennyson, Idylls of the King—selected—(The coming of Arthur, Gareth and Lynette, Lancelot and Elaine, The passing of Arthur); Morris, Atalanta's race, etc. [Adams and Rolfe selection from The earthly paradise]; Austen, Pride and prejudice; Scott, Quentin Durward; Thackeray, Henry Esmond;

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Bulwer-Lytton, The last of the barons; Trollope, Barchester towers; Blackmore, Lorna Doone; Stevenson, Kidnapped; Black, A princess of Thule; Howells, The rise of Silas Lapham; Cable, Doctor Sevier; Parker, Seats of the mighty; Mitchell, Hugh Wynne.

The questions in literary interpretation and criticism will refer exclusively to the texts assigned for careful study. The topics for composition will be taken from the texts assigned for general reading.

In response to requests from teachers, it may be stated that for the purposes of this examination an adequate presentation of rhetorical principles can be found in any one of the following high-school rhetorics [named in alphabetical order]: Gardiner, Kittredge, and Arnold, Manual of composition and rhetoric (Ginn & Co.); Herrick and Damon, Composition and rhetoric for schools—Revised edition (Scott, Foresman & Co.); Radford, Composition and rhetoric (Hinds, Noble & Eldredge); Thomas and Howe, Composition and rhetoric (Longmans, Green & Co.).

PART 2. STUDY OF A SPECIAL PROBLEM.

It will be observed that the promotional requirement for teachers of experience is not an examination in the ordinary sense of that term. It is given not at all for the purpose of finding out how much teachers know, and not wholly to find out what they can do. It has a dynamic purpose—to direct attention to problems which press for solution, and to cultivate in teachers a tendency to deal with these problems in a thoughtful way.

All teachers after receiving a salary of $600 for one year, provided they are competent to teach the regular subjects of their respective grades, may become eligible to receive a salary of $700 per annum by passing the second part of the promotional examination, which is defined as follows:

"The Promotional Examination, Part II, shall consist of: (a) A written report of the working out of some problem of teaching or the study of a particular group of children; (b) such a defense of the report before a board of examiners, consisting of the superintendent and two other members selected by him, as will evince familiarity with educational literature bearing on the problem or study; and, when required, (c) a classroom demonstration before a board similarly composed."

Promotional Examination, Part II, in 1910 is open to all teachers (except male assistants)[1] who were promoted by the board of school commissioners to the $600 salary on or before January 1, 1910. This includes even those who passed Part I of the Promotional Examination in the autumn of 1909, for the rules allow the essay in Promotional Examination, Part II, to be presented at any time after a teacher has passed Part I. Such candidates, however, can not begin their salary advance beyond $600 until they have attained the $600 salary itself by the two annual increments. It is recommended, therefore, that they defer the presentation of the essay in Part II until the first year in which they shall be receiving the $600. In this way they will be able to study more deliberately and thoroughly the problems upon which they have chosen to write.

It will be observed that the rule defines the essay as "a written report of the working out of some problem of teaching, or the study of a particular group of children." This means that the teacher is not expected to prepare an abstract or academic discussion having no relation to his own classroom problems. The essay should, on the contrary, grow out of the candidate's actual teaching; so that, instead of his being distracted from practical problems while working for the promotional examination, he shall be the more intently studying his daily work. And in case the examiners think that an essay has been written with too little reference to the candidate's actual teach-

[1] Promotional Examination, Part II, is open to all male assistants who have passed Part I. For salary schedule see Rules, Art. XXVII, sec. 28.

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ing, they will feel at liberty to call for the "classroom demonstration," in which it must be shown that the candidate was not merely theorizing in his essay.

Teachers need not hesitate to attempt such essays as are contemplated in the rule. No great display of learning is expected, but only a clear and simple presentation of every-day schoolroom experiences that have had some educational significance for the writer. To the observant teacher, who is really trying to understand the 40 children committed to his care, every school day affords such experiences; and his experiences will not exactly duplicate those of any other teacher, for his children are in many particulars unlike any other children. His observations may tend to verify or contradict what he has previously read or thought; and in either case he will be led to read further in books that treat of the aspect of teaching which has attracted his interest. Out of such reading and observation and thought will come ideas well worth being committed to writing; and these when clearly and definitely stated will doubtless form an acceptable essay. Or a teacher may secure permission to apply to his class some special plan of teaching or governing, and from his day-to-day records of this plan draw up an interesting and instructive discussion. Or why should not a teacher undertake to throw light upon class-room problems by showing how one or another procedure appears from the child's point of view? Let him show, for example, how the child is affected by this or that attitude on the teacher's part, or by this or that requirement in discipline or study. This would certainly involve "the study of a particular group of children," and would, therefore, if well done, fully satisfy the requirement. Hundreds of teachers have experiences just as interesting and just as worthy of permanent record as many of those which have in recent years found a ready market in the form of magazine articles. In fact, there are as many ways of satisfying the essay requirement as there are different tastes and aptitudes among teachers; and every good teacher is sure to become a better teacher by undertaking from time to time some such composition.

The essay when presented must be accompanied by an outline showing the trend of the argument and the conclusions reached, and by a list of the books consulted in making the study. From the list of books the candidate will submit for approval two, upon which will be based the discussion that "will evince familiarity with educational literature bearing on the problem or study." As a special caution on the use of authorities in preparing the essay, it is recommended that candidates indulge but little, if at all, in quotation. Quotations often produce the effect of needless and obstructive insertions in an otherwise straightforward and coherent discussion; and they also tend frequently to make an argument appear less sincere than if the writer had set it forth in his own style. But in case a candidate considers it necessary, at a particular point, to insert a quotation, he should at least attach a footnote citing his authority by title and page. It may be added that such slight modification of another writer's sentence as the alteration of a word or two, does not relieve one of the obligation of acknowledging the source.

Every candidate must send to the superintendent not later than September 30 the subject on which his essay is being written, and the essay itself should be presented as soon thereafter as possible. The examiners expect all essays to be in by November 1. Any essay received after that date is likely to be thrown over into the following year. Papers are to be written in a plain hand, preferably in the system of penmanship in use in the schools.

As a teacher's classroom work must be entirely satisfactory when he comes up in Promotional Examination, Part II, he may get a preliminary judgment on his teaching before he undertakes his essay or at any time during its composition. Under the rules governing advance in salaries, the concurrence of the superintendent with the principal in a favorable judgment is required. It is believed that as soon as the superintendent can take measures to meet his part of the responsibility, such favorable judgment can be given regarding a large majority of the teachers to whom this circular

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applies. In cases where this can not be done at once, needed help will be given to enable teachers to bring their work up to a fully satisfactory standard.

The formal report upon the actual class work of a candidate in this examination can not be made until the other conditions set by the rule have been met, but the candidate is of course entitled to timely information as to whether his teaching is likely to be approved under the requirements for advance to the maximum salary.

JAMES H. VAN SICKLE,
Superintendent.

BOSTON.

Teachers in Boston, Mass., must pass two promotional examinations in order to become eligible for all the advances that the salary schedule provides. These examinations precede promotions, respectively, to the third and to the seventh year salaries. The first of these examinations is obligatory, the teacher failing to pass it in two trials being dismissed from the service, while the second is optional, although the teacher who does not take it can not pass beyond the sixth year of salary.

The first promotional examination, in the words of Asst. Supt. M. P. White, consists of:

1. The teacher's success in the schoolroom during the preceding year.
2. A paper, one hour in length, giving the teacher's method of teaching some one subject.
3. A description, one hour in length, of some professional book selected from a list authorized by the board of superintendents.
4. A description, one hour in length, of some book in academic work authorized by the board of superintendents.

The method is twofold—first, to induce the teachers to notice their methods of teaching, and to make notes upon such methods.

Second, to urge them to some reading, hoping that they will acquire gradually a habit of outside reading.

The success in the schoolroom is determined by the master of the school and the assistant superintendent in charge; is based upon the teacher's power in teaching and discipline, and she is marked either satisfactory or unsatisfactory, no rating being given.

No teacher is excused from her examination on Methods; she must write that paper.

Any teacher who has taken a course which counts toward a degree in any of our universities may substitute that for the academic work.

The board of superintendents arranges two courses in subjects pertaining to the schoolroom. For instance, the first two courses were psychology and English; the next two courses were physiology and hygiene and local geography; the courses now in progress are nature study and arithmetic.

The teachers who are to take their promotional examinations at the next time they are offered may take one or both of these courses and substitute for the academic or professional, or both.

The examination is given separately to six different groups of teachers. These are (1) teachers in high schools; (2) teachers of Grades V, VI, VII, and VIII; (3) teachers of Grades I, II, III, and IV; (4) teachers in kindergartens; (5) teachers in special classes; and (6) teachers of manual training, sewing, or cooking.

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INFORMATION PERTAINING TO PROMOTIONAL EXAMINATIONS.

Instructions as to what may be expected in the examinations are given to the teachers in a circular of information. By way of illustration, the instructions for the teachers in the upper grades are inserted.

I. SUCCESS IN TEACHING.

Careful attention will be given during the year preceding the examination to the quality of the teachers' work in their classrooms, but no separate or special examination will be required to determine their markings in this particular.

II. PROFESSIONAL STUDY.

For teachers of Grades V, VI, VII, and VIII.

1. A written examination one hour in length upon any one of the following subjects that the candidate shall select:
   (*a*) Methods used by the candidate in teaching history of the United States.
   (*b*) Methods used by the candidate in teaching geography.
   (*c*) Methods used by the candidate in teaching arithmetic.
   (*d*) Methods used by the candidate in teaching English composition.
   (*e*) Methods used by the candidate in teaching nature study.
2. A written examination one hour in length upon any one of the following-named books that the candidate shall select:
   (*a*) How to study and teach history, by B. A. Hinsdale, published by D. Appleton & Co.
   (*b*) The new basis of geography, by Jacques W. Redway, published by The Macmillan Co.
   (*c*) The teaching of elementary mathematics, by David E. Smith, published by The Macmillan Co.
   (*d*) The teaching of English, by Percival Chubb, published by The Macmillan Co.
   (*e*) Nature study and life, by Clifton F. Hodge, published by Ginn & Co.

III. ACADEMIC STUDY.

For teachers of Grades VI, VII, and VIII.

A written examination one hour in length upon any one of the following subjects that the candidate shall select:
   (*a*) American literature. Text recommended as a basis for study: American literature, by Julian W. Abernethy, published by Maynard, Merrill & Co.
   (*b*) English history as related to American history from 1500 A. D. to 1800 A. D. Text recommended as a basis for study: The expansion of England, by J. R. Seeley, published by Little, Brown & Co.
   (*c*) Physical geography. Text recommended as a basis for study: New physical geography, by Ralph S. Tarr, published by The Macmillan Co.
   (*d*) Plane geometry. Text recommended as a basis for study: Elements of geometry, by Webster Wells, published by D. C. Heath & Co.

REGULATIONS PERTAINING TO PROMOTIONAL EXAMINATIONS.

The official regulations pertaining to promotional examinations in Boston are as follows:

Two promotional examinations shall be held each year, one in October and one in May, for the purpose of determining the efficiency of the teachers in the service. These examinations shall consist of three parts: (1) Success in the school during the

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preceding year, (2) professional study, and (3) academic study in some one line. For the requirements of this section with respect to academic study may be substituted such course or courses counting for a degree in a college as the board of superintendents may, from time to time, approve.

All teachers, except principals and members of the supervising staff, whose compensation is on a sliding scale with a fixed increase for each successive year of service, must take the promotional examination next following the second anniversary of the date on which they began service: *Provided*, That teachers who are appointed between October 1 and December 31 in any year may take the examination occurring in October of the second year thereafter.

Teachers successfully passing the aforesaid examination shall be placed upon the third year salary of their respective schedules on the 1st of January or the 1st of September next following the date of the examination.

Teachers who fail to pass the aforesaid examination shall remain on the salary of the second year of their respective schedules for another year, when they shall again be examined in a similar manner. If they successfully pass the examination they shall be placed upon the third year salary of their respective schedules on the 1st of January or the 1st of September next following the date of the examination, and shall be regularly advanced on succeeding anniversaries until the sixth year salary of their respective schedules is reached. The employment of teachers who fail to pass the aforesaid examinations on two successive occasions shall terminate with the 1st of September next following the date of the second examinations.

All teachers who are receiving the sixth year salary of their respective schedules shall be examined by the board of superintendents before being placed on the seventh year salary of their respective schedules. This examination shall consist of three parts: (1) Success in the school during the preceding year, (2) professional study, and (3) academic study in some one line. For the requirements of this section with respect to academic study may be substituted such course or courses counting for a degree in a college as the board of superintendents may, from time to time, approve.

Teachers successfully passing the aforesaid examination shall be placed upon the seventh year salary of their respective schedules on the 1st of January or the 1st of September next following the completion of the year during which they have received the salary established for the sixth year of service of their respective ranks, and shall be regularly advanced on succeeding anniversaries until the maximum salary of their rank or grade is reached.

Teachers who fail to pass the aforesaid examination or who do not wish to be thus examined shall remain on the sixth year salary of their respective schedules until such time as they shall have passed such examination, when they shall be placed upon the seventh year salary of their respective schedules on the 1st of January or the 1st of September next following the date of the examination and shall be regularly advanced on succeeding anniversaries until the maximum salary of their rank or grade is reached.

Teachers promoted to a higher rank in schools of the same class shall not be required to pass additional promotional examinations because of such promotion, but shall remain subject to the requirements of the regulations with respect to such examinations, and shall not be advanced in salary more than once after their original appointment until they shall have passed successfully the first promotional examination, and shall not be advanced in salary more than five times after their original appointment until they shall have passed successfully the second promotional examination.

Teachers promoted to schools of a different class shall be required to pass two promotional examinations after said promotion, at the same times and under the same conditions as new teachers appointed to similar positions.

Teachers who, on entering the service, are placed on an advanced salary of their respective ranks, shall not be advanced in salary more than once until they shall

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have passed successfully the first promotional examination, nor be advanced in salary more than five times until they shall have passed successfully the second promotional examination: *Provided*, That no teacher shall be placed upon the maximum salary of his rank until such time as he shall have successfully passed the second promotional examination.

The board of superintendents shall determine the method of estimating the teachers' success in the school, and shall determine the course of professional study. It shall prepare a list of academic subjects from which the teacher may select the one in which he prefers to be examined. (R. & R., 1908, pp. 73–75.)

CHICAGO.

The Chicago plan for the examination and the promotion of teachers is given in the following extracts from the "Rules of the Education Department of the Board of Education," adopted May 18, 1910. The maximum salary in the lower group is reached in nine years by elementary-school principals, in seven years by high-school teachers, and in seven years by elementary-school teachers. The upper groups are subject to further increases for fourteen, five, and three years, respectively.

SECTION 123. *Grouping of principals and teachers.*—There shall be two groups of principals; of teachers in high schools; of teachers in elementary schools. The groups shall have different salary schedules. Promotion from lower to upper group shall, upon fulfilling the requirements, be by vote of the board of education, upon recommendation of the superintendent.

SEC. 124. *Promotion from lower to upper group; elementary principals.*—Elementary principals, who have served a year at the maximum salary of the lower group and whose efficiency for the year immediately preceding, as shown by the records in the superintendent's office, is good, excellent, or superior, shall be eligible to promotion to the upper group upon attaining a mark of 80 per cent, or more, in an examination in professional work, including school management, psychology, educational principles and methods, and the history of education.

SEC. 125. *Promotion from lower to upper groups; teachers in high schools.*—Teachers in high schools, who hold general or limited certificates, who have served a year at the maximum salary of the lower group, and whose efficiency for the year immediately preceding, as shown by the records in the superintendent's office, is good, excellent, or superior, shall be eligible to promotion to the upper group upon attaining a mark of 80 per cent, or more, in an examination in school management, psychology, the history of education, and educational principles and methods, particularly in application to students and subject matter in the high schools. Only those high school teachers who have complied with the requirements for promotion to the upper group shall be eligible for election to principalships.

SEC. 126. *Promotion from lower to upper group; teachers in elementary schools.*—Teachers, regular and special, in the elementary and in the practice schools shall be eligible to promotion to the upper group upon fulfilling the three requirements named below:

1. They shall have served one year at the maximum salary of the lower group.
2. They shall have received an efficiency rating of good, excellent, or superior for the year immediately preceding, as shown by records in the office of the superintendent.
3. They shall have met *one* of the following conditions:
   (*a*) They shall have written both the paper in professional study and the paper in an academic field required in the promotional examination (sec. 127), and shall have attained an average of 80 per cent, or more.

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(*b*) They shall have passed the examination in professional study (sec. 127 (*a*)), and shall hold an elementary principal's certificate.

(*c*) They shall have passed the examination in professional study (sec. 127 (*a*)), and shall hold a certificate to teach in the high schools.

(*d*) They shall have passed the examination in professional study (sec. 127 (*a*)), and shall hold a certificate to teach German, music, drawing, manual training, or household arts.

(*e*) They shall present certification for five study courses from the Chicago Teachers' College Extension.

SEC. 127. *The promotional examination.*—The promotional examination for all teachers, regular and special, in the elementary schools, shall consist of two papers:

(*a*) A professional paper in psychology, educational principles and methods in the elementary schools, and the history of education.

(*b*) An academic paper in any one of the fields named below and covering work superior in grade to that of the course in the high school:

English language and literature; general history; physical science; biological science; foreign languages (Latin or Greek or German or French or Spanish); algebra and geometry; geography (physical, mathematical, and commercial) and geology; music; drawing; manual training; household arts; physical education (physiology, anatomy, and the theory of gymnastics).

NOTE.—Teachers of special subjects shall not select the subject which they teach as the subjects of their academic papers.

An average of 80 per cent shall be required for passing these tests: *Provided*, That no examination mark below 70 shall be considered: *And provided*, That if a candidate divides the examination the paper taken in the preliminary part shall not be credited in the final average unless the mark secured in such paper shall be 80 per cent or over.

Examination on study courses.—Principals and teachers, upon written notice at least six weeks in advance, stating the study course in which they desire to substitute an examination for the certification by the Chicago Teachers' College, or by some accredited institution, shall be eligible for admission to such an examination at the July or the holiday examination for teachers. A mark of 75 per cent shall be required in every examination substituted for a study course.

SEC. 147. *College extension; credits; permanent records.*—Credits for promotion may be made in the college extension, or in any institution approved by the superintendent and the principal of the normal school.

Permanent record of the certification of work done by principals and teachers in the college extension or in approved institutions shall be kept in the records of college extension: *Provided*, That not more than two credits shall be recorded for any teacher for work done within a calendar year.

CINCINNATI.

The plan of promoting teachers followed at Cincinnati does not involve promotional examinations in the narrow sense, but as it involves their equivalent in the form of college credit for professional work done it may properly be described in this section. The plan is described in the following words by Supt. F. B. Dyer in a letter to the writer:

The board of education appoints and pays a faculty of five professors in the college for teachers of the University of Cincinnati. The appointments are made by the superintendent of schools to the staff of teachers, but always with the sanction of the president of the university. The last two years of the liberal arts course may be given

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to the training of teachers. Those who take the teachers' course are thereby enrolled in the college for teachers. Upon the completion of their course they are granted certificates upon examination only in theory and practice. Besides the practice which they do in their two years' course they are expected to give two months to teaching as cadets or temporary teachers. They are then listed in the order of their rank in their practice training work and college work and are appointed invariably in this order. In the last two years it has been unnecessary to employ other than college graduates in our elementary schools, except in four instances. There are now 180 college graduates in our elementary schools.

Teachers are appointed, if without experience, at $600, and increased $50 a year to $950. If then they show that they are worthy of final promotion, they receive a salary of $1,000, the keeping of which is contingent upon their taking a course of professional work every other year. The final promotion is earned by a record of successful teaching and by taking professional work in education and kindred subjects, after appointment as teachers, to the amount of eight one-hour courses, not more than two of which may be taken in any one year.

Teachers from this list are also eligible to promotion to high-school positions at salaries ranging from $1,000 to $1,800. Promotions are made solely upon the basis of merit as teachers and upon proficiency in the subjects they are called upon to teach in the high school, e. g., those who have majored in mathematics at the University of Cincinnati are listed for appointment in high-school mathematics and are ranked in the order of their success as teachers after repeated visitation by the inspectors employed by the board.

KANSAS CITY.

The rules and regulations of the board of education of Kansas City, Mo., dated 1909, contain the following provisions:

Teachers in the grades shall be paid $500 for the first year's service, $550 for the second, $600 for the third, $650 for the fourth, and $720 thereafter, provided each year's service shows advancement satisfactory to the supervision in teaching and governing.

Teachers of not less than four years of successful and approved experience in graded-school work when first employed by the board of directors shall be paid $650 for one year and $720 per year thereafter, provided their work is in every way satisfactory.

All teachers having taught one year at the maximum salary of $720 and having passed the first promotional examination shall receive a salary of $760, and after teaching one year at $760 and having passed the second promotional examination shall receive a salary of $800 per annum, and after having taught at a salary of $800 for one year shall receive a salary of $825 per year.

No advancement shall be made in any salary unless the year's service shows advancement to the satisfaction of the supervision in teaching and governing.

INFORMATION PERTAINING TO TEACHERS' EXAMINATIONS.

The nature of the examinations is indicated by the following instructions issued to the teachers by Supt. J. M. Greenwood on September 24, 1910:

PROFESSIONAL EXAMINATION, JUNE 13 AND 14, 1911, AT MANUAL-TRAINING HIGH SCHOOL.

To the teachers who are qualified to take the second professional examination:

All teachers who passed the first professional examination in June, 1910, or before, are entitled to take the second examination in June, 1911.

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To aid you as much as possible in preparing for the approaching examination, I submit the following list of authors for you to read, and on which the examination questions will be based:

1. The history of education, Davidson.
2. Philosophy of education, Horne.
3. Talks to teachers, James.
4. The history of western Europe, Robinson.

PROFESSIONAL EXAMINATION, JUNE 15 AND 16, 1911, AT MANUAL-TRAINING HIGH SCHOOL.

To the teachers preparing for the first professional examination:

In order to help you as much as possible in preparing for the first professional examination, to be held in June, 1911, I submit the following list of books for you to read, and on which the examination questions will be based:

1. Seeley's history of education, supplemented by readings from Compayre's history of pedagogy.
2. Psychology in the schoolroom, Dexter and Garlick.
3. Manual of methods (fifth or sixth edition), Garlick.
4. Introduction to English literature, Newcomer; American literature, Newcomer.

PROFESSIONAL READING.

To the principals, high-school teachers, elementary, kindergarten, and domestic-science teachers:

You are most earnestly urged to read Habit formation and the science of teaching, by Stuart H. Rowe; How we think, by John Dewey; A writer of books, by Denton J. Snider; Ethical and moral instruction in schools, by George Herbert Palmer.

Please send in an essay on any one of these books of from 300 to 500 words on or before the close of the current school year.

Habit formation and the science of teaching should be read by all principals and teachers.

All ought to read the monograph on ethical and moral instruction in school, by Prof. Palmer.

Prof. Dewey's How we think is exceptionally suggestive, and should be read by every upper-grade teacher and principal.

A writer of books, by Denton J. Snider, should be read by every teacher in Missouri. It is a great book from one of the greatest of teachers.

All high-school teachers of physics, chemistry, biology, physiology, history, civics, mathematics, and languages, as well as all principals, are urged to read Evolution of the sciences, by Houllevigue.

LINCOLN.

The promotional plan in force at Lincoln, Nebr., as given in the rules and regulations of the board of education for 1909, is as follows:

Advances in salary.—(*a*) Regular increase. Principals, teachers, and assistants in the elementary schools receiving less than the maximum within their class shall receive $45 increase per year for each additional year of service until the maximum is reached.

(*b*) Special increase. Principals, and teachers holding first and second grade certificates who have attained the maximum salary within their class shall receive a special increase of $45 per year, provided (1) that they shall have taught not less than 2 years at the maximum salary within their class; (2) that they shall have received credit for 20 hours of university work or the equivalent in the following subjects: Education, literature, history, foreign language, science, English.

NOTE.—Of the 20 hours, 8 hours shall be required in education and 4 hours in English. The credit in English is to be based upon the teacher's ability to use correct and effective English and to secure from the pupils results in all phases of English which are satisfactory to the supervision. The remaining hours may be taken in the subjects best calculated to meet the needs of the individual teacher.

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Principals and teachers who have attained the first special increase shall receive a second special increase of $45 per year, provided (1) that they shall have taught not less than 2 years at the salary resulting from the first special increase; (2) that they shall be rated as highly efficient teachers by the supervision; (3) that they shall have received credit for 15 hours of university work or the equivalent in the following subjects: Education, literature, history, foreign language, science, English.

NOTE.—Of the 15 hours, 6 hours are required in education and 3 hours in English. The credit in English is to be based upon the teacher's ability to use correct and effective English and to secure from the pupils results in all phases of English which are satisfactory to the supervision. The remaining hours may be taken in the subjects best calculated to meet the needs of the individual teacher.

Graduates of normal schools shall be given the first special increase after having taught at the maximum salary for 3 years without securing additional university credits. Graduates of universities shall be given the first special increase after having taught for 2 years at the maximum salary. University graduates upon receiving their master's degree and having served at the first special increase for 2 years shall be given the second additional increase.

NEW YORK CITY.

The following brief description of the promotional examinations in New York City was kindly furnished by Supt. William H. Maxwell:

At present in New York there exists, in addition to the license held by the rank and file of elementary-school teachers, a license for promotion (for appointment to grades 7A and 8A, inclusive) and a graduating-class license (for appointment to grade 8B). The examinations for these licenses are substantially identical, and include, first, a written examination in English and in one of the following subjects: Mathematics (arithmetic, algebra, plane geometry); history (English history, American history, and civics); geography and elementary science (geography and elementary physics); drawing and constructive work (drawing in pencil from still life, applied design, working drawings).

Secondly, there is required an oral examination, a part of which includes an inspection of classroom teaching. Classroom efficiency is also rated upon consideration of the official record marks given teachers by principals and district superintendents. Length of experience is another element considered; also the giving of time, after school hours, to supplementary activities, such as athletics. Only those teachers who pass the written examination are given the oral and classroom tests. All final ratings are made by the board of examiners.

A more detailed account of these examinations is given in the following circular issued by Supt. Maxwell on April 20, 1910:

An examination for license for promotion and an examination for license as teacher of a graduating class will be conducted by the board of examiners on Thursday, September 8, 1910. The written examination of women applicants will be conducted in the examination room (No. 422) at the hall of the board of education; the written examination of men applicants will be held at the De Witt Clinton High School.

The scope of the written examination, which will be identical for both grades of license, is as follows:

1. Thursday, September 8, 1910:
   9.15 a. m. English (grammar, composition, literature).
   1.30 p. m. Mathematics (arithmetic, algebra, plane geometry).
   History (English history, American history, and civics).
   Geography and elementary science (geography and elementary physics).
   Drawing and constructive work (drawing in pencil from still life; painting in water colors from nature and still life; applied design; working drawings). NOTE.—This examination will be continued on a day to be appointed later.

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2. An examination in principles and methods of teaching to be held later at the call of the board of examiners.

All applicants will be required to pass the examination in English and in one of the following groups, viz, mathematics, history, geography, and elementary science, or drawing and constructive work.

Exemption from the examination in principles and methods of teaching will be accorded only to those applicants who present evidence of having completed in an approved institution satisfactory courses amounting to at least 60 hours in principles and methods of teaching.

Exemption from the entire written examination will be accorded those applicants for graduating class license who secured the license for promotion (between 1902 and 1908) after an examination in which a rating of 65 per cent or over was secured in the academic subject. Such teachers, if eligible under the conditions stated below, may file an application for the higher license on or before June 11, 1910. A blank form will be sent on request.

An oral examination (including inspection and investigation of teaching), to be conducted at the call of the board of examiners, will be required of all applicants for license for promotion and of all applicants for license as teacher of graduating class.

CONDITIONS OF ELIGIBILITY.

License for promotion.—To be eligible for license for promotion, applicants must have the following qualifications:

(*a*) The holding of license No. 1.

(*b*) Three years' successful experience in teaching.

License as teacher of a graduating class.—To be eligible for license as teacher of a graduating class applicants must have the following qualifications:

(*a*) The holding of a permanent license No. 1 or of a license for promotion.

(*b*) Five years' successful experience in teaching.

This examination will be open only to those who will fulfill the conditions of eligibility prior to October 8, 1910.

It is not necessary that candidates file any notification of their intention to enter the examination.

The examinations will commence promptly at the times stated above, and no applicant who is late will be admitted.

Section 67, subdivision 4, of the by-laws of the board of education as amended on April 13, 1910, provides that "a license for promotion shall qualify the holder to teach in grades 7A, 7B, and 8A in elementary schools. A license as teacher of a graduating class shall qualify the holder to teach a class of Grade 8B."

New York has a 17-year salary schedule for female elementary-school teachers, a 13-year schedule for male elementary-school teachers, and an 11-year schedule for high-school teachers.

Salaries are increased annually by a stated amount until the maximum is reached, with the exception that at the end of the seventh and twelfth years in the elementary schools, and at the end of the fourth and ninth years in the high schools the salary of a teacher is not increased "unless and until the service of such teacher shall have been approved after inspection and investigation as fit and meritorious by a majority of the board of superintendents."

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PATERSON.

Increases in the salaries of teachers at Paterson, N. J., are based on a system of teachers' licenses, as follows:

Kindergarten license No. 1, granted for one year and may be renewed for one year. Candidates must be graduates of a four-year high school or its equivalent and a two-year normal course or its equivalent, and in addition thereto must have one-half year of special preparation for kindergarten teaching.

Kindergarten license No. 2, granted after two years of satisfactory service in charge of a kindergarten class.

Teachers' license No. 3, good for one year and may be renewed for one year.

Teachers' license No. 4, granted after two years of satisfactory service.

Teachers' license No. 5, granted after six years of satisfactory service upon examination, or upon the satisfactory completion of 120 hours of university work.

Teachers' license No. 6, granted after 10 years of satisfactory service upon examination, or upon the satisfactory completion of 240 hours of university work.

Head of department license No. 7, granted upon written examination, or upon the satisfactory completion of 240 hours of university work and an oral examination in school management and classroom supervision, provided that the university work offered for license No. 7 is in addition to any work offered for license No. 6, and provided further that a candidate for license No. 7 holds license No. 6.

High-school license No. 8, granted on competitive examination to women only, and may be renewed for one year. Candidates for this license must be college graduates and must have at least two years of experience in high-school teaching.

High-school license No. 9, granted to women after one year of satisfactory service.

High-school license No. 10, granted to women on examination, or upon the satisfactory completion of 150 hours of university work.

High-school license No. 11, granted to men on competitive examination, and may be renewed for one year. Candidates for this license must be college graduates and should have at least two years of experience in high-school teaching.

High-school license No. 12, granted to men after one year of satisfactory service.

High-school license No. 13, granted to men on examination, or upon the satisfactory completion of 150 hours of university work.

Normal-school critic teachers' license No. 14, granted on competitive examination and may be renewed. Candidates must be graduates of a normal school having a standard two-year course, and must have had at least five years of experience in teaching and a rating of at least 90 per cent in teaching.

In addition to the foregoing, candidates must present evidence of the satisfactory completion of 150 hours of university work.

Normal-school license No. 15, granted on competitive examination and may be renewed. Candidates must be graduates of a normal school having a standard two-year course, and have six years of experience in teaching, of which one year shall be of normal-school work. In addition to the above, candidates must present evidence of the satisfactory completion of 720 hours of university work, of which one-half has been given to professional study.

Manual-training principals' license No. 16, granted on competitive examination. Candidates must be graduates of a four-year high-school course and must have spent one year (360 hours) in special preparation in manual-training teaching, and must have at least two years of experience in manual-training teaching.

Principals' license No. 17, granted upon competitive examination to men only. Candidates for this license must have either of the following qualifications:

(*a*) Graduation from a college or university.

(*b*) Graduation from a State normal school and the equivalent of two years of university work.

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In addition to (*a*) or (*b*), candidates for this license must have seven years of experience in teaching, at least two of which must have been in supervision.

Principals' license No 18, granted after one year of satisfactory service.

Principals' license No. 19, granted on competitive examination to men only.

Normal-school assistant principals' license No. 20, granted on competitive examination and may be renewed. Candidates must be graduates of an approved normal school with a standard two-year course, and must have six years of experience in teaching, of which three must have been spent in normal-school work. In addition to the foregoing, candidates must present evidence of the satisfactory completion of 900 hours of university work, 450 hours of which shall be in professional study.

Normal-school principals' license No. 21, granted on competitive examination to men only, and may be renewed. Candidates must be college graduates and must have 10 years of experience in teaching, which must include experience in elementary school work. At least three years must have been spent in normal-school work.

High-school principals' license No. 22, granted on competitive examination and may be renewed. Candidates for this license must be college graduates and must have at least seven years of experience in high-school teaching.

SAGINAW.

The regulations of the board of education in regard to teachers' salaries and the promotional examinations arranged by the professional study and examination committee for the Saginaw (Michigan) East Side Public Schools are described in the following extracts from the "Rules," dated 1909:

The following schedule of salaries and rules for the promotion of teachers was adopted at the meeting of the board of education, August 15, 1906, and revised by the board May 19, 1909, and October 20, 1909:

RULES AND REGULATIONS.

Section 25. Teachers below the high school shall be divided into two divisions, known as Division B and Division A. In each division there will be different groups, groups 1, 2, 3, and 4, belonging to Division B, and groups 5, 6, 7, and 8, belonging to Division A. Teachers in the different groups and divisions shall include those who have taught at least as many years as are indicated and the salaries shall be as stated.

DIVISION B.	Salary per month.
Group 1. First year of teaching	$35.00
Group 2. Second year of teaching	40.00
Group 3. Third and fourth years of teaching	45.00
Group 4. Fifth year of teaching	50.00

Unless otherwise ordered by the board.

The superintendent and committee on teachers, schools, and schoolbooks shall recommend to the board of education all promotions of teachers from one group to another within Division B, which recommendation shall be conditioned on successful and satisfactory work as determined by ability to teach, professional spirit, attitude toward the school and children, spirit of growth and desire to excel.

DIVISION A.	Salary per month.
Group 5. Sixth year of teaching	$52.50
Group 6. Seventh year of teaching	55.00
Group 7. Eighth year of teaching	57.50
Group 8. Ninth and subsequent years of teaching	60.00

Unless otherwise ordered by the board.

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Assistant principals in charge of eighth grades shall be entitled to $5 per month in addition to the salary of teachers in the same group. Teachers of seventh grades shall be entitled to $2.50 per month in addition to the salary of teachers in the same groups unless otherwise ordered by the board.

The superintendent and committee on teachers, schools, and schoolbooks shall recommend to the board of education all promotions from one group to another within Division A, and also the retention of teachers in group 8, which recommendation shall be conditioned (1) on successful and satisfactory work, as determined by ability to teach, professional spirit, attitude toward the school and children, spirit of growth and desire to excel; (2) on completing annually to the satisfaction of the superintendent and board of education a course of reading approved by the professional study and examination committee. (In lieu of this course of reading a certificate of attendance of not less than four weeks at an approved summer school will be accepted.)

Promotion from Division B to Division A:

Those teachers who have taught within the jurisdiction of this board successfully at least five years are eligible to appointment to Division A, who—

First. In teaching ability for the years taught are rated at least 75 per cent. This rating shall be determined by averaging the marks each year of the superintendent and principal of the building in which the teacher is employed, and such other matters as shall be presented. In determining the rating for teaching ability the following points shall be considered: (a) Power to instruct; (b) power to inspire ambition in pupils; (c) power to secure moral conduct, or a right attitude on the part of pupils toward the school and society.

Secondly. Shall give satisfactory evidence by examination or otherwise of having successfully pursued a course of professional reading and study, approved by the professional study and examination committee, said work to be done while the teacher is teaching in group 1, and to be known as Professional Study I.

Thirdly. Shall read annually while teaching in groups 2 and 3 a work on education approved by the professional study and examination committee and make a written report on the same to the satisfaction of the professional study and examination committee and the board of education, and to be known as Professional Study II.

Fourthly. Shall present a written report on some phase of educational work or on some problem of teaching (the topic to be approved by the professional study and examination committee), and defend the same to the satisfaction of the professional study and examination committee; said report and defense to be made while the teacher is teaching in group 4, and be known as Professional Study III. (In lieu of the professional study outlined in the preceding three paragraphs, other evidence of study and advancement may be offered, such as certificates of attendance at approved summer school, etc., which shall meet the approval of the professional study and examination committee.)

The professional examinations mentioned above are to be conducted by a committee known as the professional study and examination committee, to be composed of three persons, viz: The superintendent and two others to be elected annually at the regular meeting of the board of education in January, one of whom is to be chosen by the teachers and one by the board of education.

DIVISION B.

Group 1 (First Year of Teaching).

PROFESSIONAL STUDY I.

For the year 1909–10 the committee has selected as Professional Study I McMurry's How to study and Teaching how to study. The superintendent will conduct a class in this subject designed especially for this group of teachers.

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Groups 2 and 3 (Second, Third, and Fourth Years of Teaching).

PROFESSIONAL STUDY II.

Each teacher in her second, third, and fourth years of teaching is required to read one of the following books (or another to be approved by the professional study and examination committee) and to present a written review of the book selected. The selection of a book must be made by October 10 in each year and the selection reported to the professional study and examination committee on or before this date. The review must be in the hands of this committee by May 10 following. The books named below may be examined at the superintendent's office:

Bagley: The educative process. The Macmillan Co. 1905.

Hall: Youth—Its education, regimen, and hygiene. D. Appleton Co., 1906.

McMurry: How to study and Teaching how to study. Houghton, Mifflin Co., 1909.

Huey: The psychology and pedagogy of reading. The Macmillan Co., 1906.

Colby: Literature and life in school. Houghton, Mifflin Co., 1906.

MacClintock: Literature in the elementary school. University of Chicago Press, 1907.

Warner: The study of children and their school training. The Macmillan Co, 1897.

Group 4 (Fifth Year of Teaching).

PROFESSIONAL STUDY III.

Those teachers who are to apply for promotion from Division B to Division A will present as Professional Study III a written report on some phase of educational work or some problem of teaching. The following topics are suggested, although the teacher's choice need not be limited to the topics here named. In case, however, another topic than one here suggested is selected, the topic must be reported to the professional study and examination committee and approved by them on or before October 10 of the year in which the report is to be presented.

1. Different methods of teaching reading to beginners.
2. The value of oral work in stories in primary grades.
3. Annual versus semiannual promotions.
4. Are too many subjects taught in the elementary schools?
5. The purpose of nature study in the schools.
6. The result of child study.
7. School physicians and the responsibility of the school for the health of its pupils.
8. The influence of geography on the history of the United States.
9. The meaning of the new geography.
10. The school as a social center.
11. Which is more useful for training in morals—science or literature?
12. How can the school teach manners and morals?
13. The teacher as a factor in the evolution of society.
14. Schoolroom decoration—its effects on pupils.
15. Diversity versus thoroughness in education.
16. Kindergarten training for very young pupils—pro and con.
17. School athletics—do they accomplish the desired end?
18. How may the schools be brought into closer touch with homes?
19. The difficulty of reaching the individual in crowded schools.
20. Would teachers favor teachers' pensions.
21. Different methods of discipline required by pupils of different ages.
22. The future American citizen—What will he most need?
23. Points on teaching pupils to be independent in thought, action, and character.
24. Interest versus duty as an incentive to work.
25. Are there fads in education?

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26. The departmental system—its advantages and disadvantages.
27. Home study—should any be required of pupils below the high school?
28. Are our schools accountable for the excessive nervousness of children?
29. Methods of teaching arithmetic in the lower grades—historical and theoretical.
30. The value of the study of history.
31. Benefits of manual training in schools.
32. What should the course of study in language be below the high school?
33. The dogma of formal discipline.
34. Classical versus scientific study—which affords the better training for the world to-day?
35. The value of the study of psychology to teachers.
36. Good and bad features of examinations.

DIVISION A.

All teachers whose salary is $52.50 per month or more are included in Division A. Such teachers are expected to pursue a course of reading or study each year. Below are outlined several courses of reading which will suggest what is meant. Any regular and systematic course of study will be accepted by the committee as fulfilling this requirement, but in case any other course is offered than those printed below, it will be necessary for the teacher to report the selection to the professional study and examination committee for approval on or before October 10 of each year. At the end of the year a report must be made to the committee on or before May 10, showing the work done.

1. Life and works of Hawthorne.
2. Shakespeare's genius and works.
3. The study of music.
4. Books on art.
5. History of arithmetic and methods of teaching it.
6. The influence of geography on history, especially as regards American history.
7. The telling of stories to children.
8. The life and work of Pestalozzi.
9. The territorial growth of the United States.
10. The physical nature of the child.
11. Child study.
12. How to study.
13. Schurz, Carl: Reminiscences of.
14. The study and teaching of Geography.
15. School administration.
16. Theory of education.
17. The teaching of English.
18. The Revolutionary War.
19. Robert Louis Stevenson.
20. Tennyson.

Each of the twenty topics last mentioned is accompanied by an outline and bibliography, which together occupy approximately 8 pages.

SPRINGFIELD.

The promotional plan in force at Springfield, Ohio, is as follows:

An increase of $50, except the last two increases, which shall be $25 each, shall be allowed to each elementary teacher annually until the maximum salary is reached, subject to the following requirements: (*a*) The teacher's efficiency in actual classroom work shall be estimated by the principal and superintendent in one of the terms,

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poor, fair, good, or excellent. A teacher must attain the estimate of fair or higher to be granted each of the first three annual salary increases and must attain the estimate of good or higher to be granted the fourth and all subsequent increases. (*b*) Subject to the exceptions named below, until the maximum salary is reached, each teacher is required to make study each year of one book of psychology, school management, child study, or other phase of pedagogy; one general work related in subject matter to some culture study taught in the schools; and a group of English classics. These books shall be assigned by the superintendent of schools before the close of the school year in June, and upon them each teacher shall present to the superintendent before the first day of the following May three briefs of approximately 2,500 words each, written in the teacher's own hand and reviewing, respectively, these assigned books and groups of classics. At the option of the teacher, instead of presenting briefs, an examination upon the books and classics may be taken before the city examiners at their April meeting. The usual notice of intention to take such examination must be filed with their clerk. (*c*) Exemption from the requirement either of presenting briefs or taking examination may be had in the following manner: Full or partial exemption may be had through agreement with the superintendent to do work in summer school or college; full or partial exemption may be had also through agreement to substitute attendance and work at club meetings. For this purpose the study of each assigned book or of the assigned group of classics, with the brief or examination reviewing it, shall be represented by 10 credits, the whole scheme of study for the year being represented by 30 credits. The entire 30 credits may be earned by attendance at meetings of a study club and participation in its discussions of its prescribed readings. Such a club must have three or more members and must hold eight or more meetings upon each prescribed book or group of classics. The 10 credits assigned to the English credits may be earned by attendance upon eight or more meetings of a literary or professional club and the performance once within the year of some substantial duty on its program. In all cases the plans or programs of study or other clubs shall be approved by the superintendent and certificates of attendance and work shall be made to him by the secretaries.

These rules shall be applied also in advancing the salaries of special teachers, principals, high-school teachers, elementary-German teachers, and kindergartners, except that the amount of annual increase may be different and except that the superintendent may assign different studies to them as being more appropriate for improvement in their respective fields of work. (A. R., 1909, p. 81.)

WASHINGTON.

The law, passed in 1906 and amended in 1910, regulating the promotion of teachers in the schools of Washington, D. C., reads as follows:

A teacher shall not be promoted from one class to another, except by the board of education, upon the recommendation of the officer having direct supervision of said teacher and in the case of colored teachers upon the additional recommendation of the colored assistant superintendent. Such recommendations shall in each case be made through and with the approval of the superintendent of schools.

Teachers shall be promoted for superior work from Group A to Group B of class six only after oral and written examinations by the board of examiners upon recommendation as follows:

All high and normal school teachers and teachers of the manual-training schools upon the recommendation of their respective principals.

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Such recommendations shall in each case be made through and with the approval of the superintendent of schools, and with the additional recommendation of the colored assistant superintendent for the colored teachers.

* * * * * * *

Provided, That hereafter no teacher shall be eligible to Group B, class six, who has not attained the maximum of Group A: *And provided further*, That hereafter no more than seven teachers shall be promoted in any one year from Group A, class six, to Group B, class six.

This law, it is clear, provides for only one promotional examination, which strikes the teachers of the high and normal schools and the teachers of the manual-training schools, which are also high schools.

The salary schedule in Group A of class six begins with $1,000 and ends with $1,800, and that in Group B begins with $1,900 and ends with $2,200, the annual increase in each group being $100.

So far only one promotional examination has been held under this law. This was in 1907, when seven teachers were promoted. This explains the otherwise inexplicable number seven in the amendment quoted above.

GENERAL DISCUSSION.

The fact that length of service is not omitted in the advancement of teachers on the basis of promotional examinations is indicated in all these plans except that of Springfield, Ohio. In Boston, promotion to the third and seventh year salaries only requires examinations; in Chicago, promotion from the lower to the upper group; in Kansas City, promotion after the fourth increase; in Lincoln, promotion after the regular maximum has been reached; in New York, promotion to the higher grades of the service; in Washington, promotion from Group A to Group B of class six; and in Saginaw, Mich., promotion after the third increase, although professional reading is required earlier. It is especially worth noting that the first few increases, the number varying from two to nine, are granted without examinations. This appears to be a wise method, for a teacher needs his time during the first few years of teaching for the preparation of his daily work.

Failure to pass a promotional examination appears to throw the teacher out of the service in only one instance, viz, failure to pass the first promotional examination in Boston. The examination is required for promotion to the third-year salary, and unless a teacher passes it in two trials he is dismissed. As this examination comes early in the teacher's career, it is probably looked upon as an examination for admission into the service. On no other basis would it seem fair that failure to take or pass a promotional examination should operate to discontinue a teacher's services. Promotion should of course not follow without passing the examination.

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Promotional examinations may be satisfied in whole or in part by work taken successfully in summer schools or in after-hour or extension classes offered by colleges and universities in Boston, Chicago, Cincinnati, Kansas City, Missouri, Lincoln, New York, Paterson, and Springfield, Ohio. This must have a wholesome effect on the teaching corps, especially when it is provided that no teacher shall be permitted to overload himself with work.

The attitude toward promotional examinations varies greatly among different educators. Some grow enthusiastic over their merits. Supt. J. M. Greenwood, of Kansas City, for example, says: "The promotional plan has led to a remarkable awakening. Classes of teachers have been organized, lecture courses arranged, syllabi of work prepared, and mental activities aroused which indicate a genuine revival of learning in the city." (N. E. A., 1905, p. 248.) A similar sentiment, but at greater length, is expressed by Supt. H. J. Wightman, of Ardmore, Pa., in the Pennsylvania school journal, 57: 477, May, 1909.

But others are not so sanguine. Not only the teachers, but also many superintendents, disapprove of them. Supt. Frank B. Cooper, of Seattle, Wash., says: "I do not believe that teaching efficiency can be determined by an examination;" Supt. G. T. Smith, of Peoria, Ill., thinks that promotional examinations are "inadequate in bringing teaching qualities into the schoolroom, and produce much the same spirit and general results as forcing a child to pay attention;[1] while Supt. J. H. Phillips, of Birmingham, Ala., thinks that "the danger here lies in the emphasis placed on the work done outside the school rather than in the school." (A. R., 1907, p. 26.)

A number of other superintendents express themselves adversely in regard to these examinations in their annual reports, but the following from Supt. Chadsey, of Denver, Colo., will suffice in closing these criticisms, the trend of which is much alike.

Supt. Chadsey, in his annual report for 1908–9, discusses at some length the various merit systems for increasing salaries and decides against them. He subscribes to the arguments "that the teacher passing the most brilliant examination is just as apt to be an inferior teacher as one unable to pass any kind of an examination," and that the ranking of teachers on the basis of classroom efficiency—

> necessitates a more or less formal inspection and report of schoolroom efficiency which many teachers claim to be unjust and often absolutely incorrect. * * * Such a scheme unavoidably results in the charge of gross favoritism, a charge which it is impossible either to prove or refute. Probably any individual inspector has confidence in his own ability to select the superior teachers under his observation. It is equally probable that no one will be satisfied with his judgment except the individuals recommended for such increase in salary.

[1] School and Home Education, 26: 264.

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The really vital point in such a discussion as this is whether through any system devised the incoming teacher into our ranks can be made more effective and more valuable to the schools. Therefore, the fundamental thing is to establish such a standard, academically and professionally, as will result in more highly trained and effective teachers entering the school systems each year, leavening by their enthusiasm, training, and culture, the whole corps of teachers. No school superintendent should be satisfied unless his new teachers every year average higher in training, culture, and ability than does his corps as a whole.

In discussing the attitude of teachers toward promotional examinations, it is necessary to distinguish between promotion in position, or grade of license, and promotion or increase in salary. Examinations for distinct promotions in position or higher licenses, as is the case in New York, are usually not objected to, but teachers do not take so kindly to examinations for increases in salary.

As a rule teachers in places where promotional examinations are in vogue do not venture to express their sentiments respecting these examinations, but the Baltimore elementary teachers have recently formulated 27 objections to examinations for increases in salary. Some of these objections are of a local nature but the following are sufficiently general to be included here:

There should be equal pay for equal work. Examinations raising a few teachers at a time make compensation unequal.

Different pay for the same work causes jealousy and dissatisfaction; confusion and discontent—bad elements to have in any school system.

Preparation for examination will naturally be paramount and must interfere with classroom work.

Teachers must be free to teach; not be harassed by recurring examinations.

Recurring examinations and obligatory special courses tend to over-professionalize the teacher by focusing her mind and efforts entirely upon her profession, thus biasing and limiting her horizon.

Obligatory special courses make unwarranted demands upon an already too small salary.

The relation of the salary received to a $150 summer course and a $50 increase is not well proportioned.

Daily preparation for modern, specialized, scientific teaching leaves little time for preparation for examinations.

Some leisure is an absolute necessity for culture, one great requisite for the modern teacher. Examinations added to modern overlapping school duties will absorb whatever leisure still remains to the teacher.

In no other profession or calling are persons of recognized ability who have carried on their work successfully for a number of years required to submit to examinations to have their status recognized.

A more liberal and considerate policy must be pursued toward teachers or no one will enter the profession and hence, by a devious route, we will surely return to that now obsolete feature, the "inefficient teacher."

CLASSROOM EFFICIENCY AND SUCCESS GRADES.

It is clear from the provisions pertaining to promotional examinations that the ability to pass examinations is nowhere taken as the sole basis for advancement. Classroom efficiency is given specific

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consideration in every plan. The proposition that advancement can not be adequately determined on the basis of promotional examinations alone would probably be agreed to by no one more readily than by the superintendents of the cities having these very examinations. The things that these examinations primarily measure are academic and professional knowledge, and while these are important characteristics of the teacher, they are important chiefly through the bearing that they have on teaching efficiency. Skill in the schoolroom must after all be the primary ingredient in any merit system of promotion.

The merit system of promotion without promotional examinations may be illustrated by the practices followed in Washington, D. C., and in Salt Lake City, Utah.

In Washington the teachers are rated as excellent, good, fair, etc., by the supervising principals in consultation with the directors of the primary and the intermediate grades, and whenever an opportunity for promotion occurs the excellent senior teacher in the division in which the opportunity occurs is promoted. Should there be no fully qualified teacher in this division, then the best senior teacher from some other division is taken. In Decatur, Ill., a similar plan is followed.

At Salt Lake City an elaborate salary schedule with 23 classes from A to W, and 49 subclasses was adopted by the board of education on May 25, 1909. The salaries range from $500 to $875. The official regulation is as follows:

An effort is made in this general scheme to base the salary on individual merit. It has not, however, yet seemed practicable, if advisable, to eliminate entirely the element of length of service, but as a factor in determining the salary of a teacher, this element has not forced itself conspicuously to the front.

The class to which a teacher belongs in the schedule is determined by the present salary, and the salary in this class to be received by her next year will be determined by the general efficiency of her work as shown by the records in this office. For example, in Class A, teachers having a rating in efficiency of 75 per cent or above will receive $550 next year; those having less than 75 per cent but more than 69 per cent will be paid $500.

SUCCESS GRADES.

The methods of measuring teaching efficiency vary considerably in different places, but in broad outline there are only two types. The efficiency of teachers may be determined either indirectly by an examination of the pupils in their charge, or directly by the judgment of the principal and supervisors.

The first method is apparently not used alone anywhere, but the plan followed at Butler, Pa., approximates it. This plan is described in the following words by Supt. Gibson in the Pennsylvania School Journal, 54:456. This description contains the criticism that might be directed against the method when used alone:

It does not matter about theory, it is the final test that demonstrates what the teacher's work has been. It is difficult to test the spiritual side of teaching, but the teacher

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must know how her work is compared to the work of other teachers. So we test monthly in the seven grades. The questions are prepared by the principals and the superintendent. They take a different subject each month. The questions are sent out from the office and are given out to several teachers for correction. In order to get uniformity in marking, one teacher has all the papers in a given subject.

The list of per cents is sent to the superintendent and copies are hung up in all the buildings, showing the relative standing of all the pupils examined. This system is continued during the first four months. As soon as the results of these tests are collected, the superintendent knows where the weaknesses are and at once puts on the pressure where it is needed. At the end of the first half year these percentages with other outside considerations are the basis of promotion. A tabulated list of the promotions is published. All teachers see the necessity for careful planning, and have seen standards of good work and their own standing.

If that were continued throughout the year, the spirit would be crushed. But during the second half of the year we put the emphasis on the spirit. We now suggest to the teachers courses of reading that will give them broader views of the subjects they teach, and these suggestions are carried out.

The method most frequently used in rating the schoolroom efficiency of teachers is the second one mentioned above, the one based upon the judgment of the principal and supervisors. Descriptions of this method as actually used were obtained from Chicago, Ill.; Decatur, Ill.; Kansas City, Mo.; Lincoln, Nebr.; Saginaw, Mich.; Washington, D. C., and from the States of Indiana and Maryland. The plans used in these places are given in the following pages. The Baltimore, Boston, and New York plans have been briefly described above under promotional examinations.

CHICAGO.

In Chicago the principal of each school makes a report twice each year to the superintendent on the efficiency of the teachers of the school, ranking each teacher as superior, excellent, good, fair, or inefficient. Once a year the district superintendent also gives a rating of each teacher.

DECATUR.

MEASURING THE TEACHER'S WORK.

That teachers may be fairly judged and their work justly estimated as to its worth, a system for securing the combined judgment of all those officers of the schools who possess a professional knowledge of a teacher's work has been devised and used. It is aimed by means of this system to eliminate, or at least to reduce to the minimum, the personal element in estimating each teacher's work.

In some way, as in any business institution, an estimate must be placed upon each teacher's work. This estimate is a guide to the board in determining reappointments, promotions, and salaries. If this estimate is the result of any one individual's judgment, more injustices are apt to result than if the estimate is determined by the combined judgment of all those school officers who possess professional knowledge of the work a teacher has been doing and of the detailed results she has been securing.

For the accomplishments of the results briefly indicated above, the following schedule, analyzing certain essentials in any teacher and her school, has been formulated:

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DETAILED SCHEDULE FOR ESTIMATING A TEACHER'S SUCCESS.

1. *Physical aspect of school.*—Neatness, order, and tidiness of room, blackboard work, children's work and desks, teacher's desk, cloakroom, etc.

Poor, fair, medium, good, excellent.

2. *The teacher personally.*—Health and vigor, as evidenced by animation, vivacity, and life in work, attractiveness in person, manner, and dress, pleasantness and forcefulness of personality.

Poor, fair, medium, good, excellent.

3. *Adaptability.*—Readily, easily, and smoothly adjusts to changed conditions, new problems, new methods, new undertakings in the building or system.

Poor, fair, medium, good, excellent.

4. *Loyalty to school officiary.*—And to their policies in general at all times and in all places; disposition to look out for and support school's interests and protect school property.

Unreliable, questionable, indifferent, good, unswervingly true and alert.

5. *Spirit of cooperation.*—And value in efforts requiring "team work" among teachers.

"Briery," disagreeable, indifferent, good and helpful, unusually fine.

6. *Attitude toward pupils.*—And sympathy with their shortcomings and interests.

"Naggy" and sarcastic, impatient, reluctantly tolerant and may be insincere, patient and tolerant, dignified but warm and sympathetic.

7. *Discipline and control in school.*—Vengeance and repression absent, reformation little in evidence, formation and molding of conduct from inside out through predominance of inspirational methods, making use of the rewards and punishments unnecessary. Order not constrained, unnatural, and dead, but free and natural, resulting from interesting occupation with regular work, yet promoting the maximum of work on the part of each pupil. Formalism, indifference, and carelessness absent.

Poor, fair, medium, good, excellent.

8. *Teaching skill.*—Involving (1) securing maximum of progress and growth with minimum expenditure of time and energy and with minimum of waste; (2) adapting manner and methods to particular ability and interest of her children; (3) ability to grasp new methods of work and to respond to suggestions; (4) power to develop industry, originality, independence, and initiative in children; (5) evidencing the ability to bring pupils into right conscious emotional attitude for new work, and to unify energies of entire class on the problem in hand through pedagogical questioning and directions; (6) thorough preparation of teacher both academically and professionally for handling the subject matter in hand.

Poor, fair, medium, good, excellent.

9. *Professional interest.*—As indicated by anxiety for best thought and methods, leading to reading of modern books and magazines on teaching, and to enthusiasm in all meetings for the professional advancement of teachers.

Poor, fair, medium, good, excellent.

10. *General impression.*—As to merit of teacher and her work.

Poor, fair, medium, good, excellent.

This detailed schedule is supplied to each supervisor (so far, the supervisors of music, drawing, and primary grades) who has knowledge of a teacher's efforts and results in any phase of school work, and to each school principal. With it is supplied the following condensed schedule derived from the foregoing schedule.

SCHEDULE FOR GRADING SUCCESS.

The items to be marked are ten in number. A maximum value has been assigned each item. The total value of the combined maximums is 100. One of five grades

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shall be given each teacher under each item. Do not grade the teacher on any item in which you feel your knowledge is too limited. The above detailed schedule explains the content to be considered in marking each item.

Value each item.	Teachers.	Teachers' names are entered by grades for supervisors and by buildings for principals.													
5	Physical aspect of school..... P, 3; F, 3.5; M, 4; G, 4.5; E, 5.														
10	The teacher personally..... P, 6; F, 7; M, 8; G, 9; E, 10.														
5	Adaptability..... P, 3; F, 3.5; M, 4; G, 4.5; E, 5.														
10	Loyalty to officiary..... Unreliable, 6; Questionable, 7; Indifferent, 8; Good, 9; Unswervingly true and alert, 10.														
5	Spirit of cooperation..... Briery, 3; Disagreeable, 3.5; Indifferent, 4; Good and helpful, 4.5; Unusually fine, 5.														
10	Attitude toward pupils..... Naggy and sarcastic, 6; Impatient, 7; Reluctantly tolerant and insincere, 8; Patient and tolerant, 9; Dignified but warm and sympathetic, 10.														
15	Discipline and control..... P, 7; F, 9; G. 13; M, 11; E, 15.														
20	Teaching skill..... P, 12; F, 14; M, 16; G, 18; E, 20.														
10	Professional interest..... P, 6; F, 7; M, 8; G, 9; E, 10.														
10	General impression..... P, 6; F, 7; M, 8; G, 9; E, 10.														

It is needless to say the estimates thus received are considered strictly confidential. They are neither open to the inspection of the teachers concerned nor to that of the various supervisors who make estimates. All estimates are carefully tabulated on a sheet where they can be studied in a comparative way. On this sheet is provided a space for the superintendent's comments and estimate. After this combined estimate is completed, upon request, teachers may receive, in a private conference with the superintendent, the benefit of the suggestions which the estimates may lead to. All of the aforesaid data and the matters discussed in the conference are focused solely in the direction of efficiency in the system and of the greatest possible growth on the part of each teacher concerned.

AIM OF SUCCESS SCHEDULE.

The aim is in no sense to institute a system of espionage, but rather it is to form judgments affecting the efficiency of the schools and the welfare of teachers upon efforts to express definitely and honestly the worth of each teacher and her work. Surely, this method is fairer both to the schools and to the teachers than the single judgment of any one officer. No superintendent, making up his judgment alone, can hope to approximate the degree of justice in his estimates which will result if he acts under the guidance of the quantitative judgments of three or four other school officers, who are as capable from their point of view as he is from his standpoint. Even if he confers with other officers in determining his opinions, their ideas are not definitely grasped, and he acts in view of what impressions he received in the conference. Such a conference does not secure the cool, deliberate, comparative judgment of the officer conferred with, either. The conditions do not favor it. For that matter, the method we use secures all of the benefits of the conference plus the value of the accurate marking, for the conferences both precede and follow the markings turned in to the superintendent. (A. R., 1909.)

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KANSAS CITY.

The rating of the teachers in Kansas City, Mo., is obtained by means of a blank like the following, which is explained by the instructions preceding it:

ANNUAL REPORT ON TEACHER'S STANDING.

To Principals:

Rule 84 of Rules and Regulations provides as follows:

"Principals shall, at the close of each term, or oftener if required, and at the close of the year, transmit to the office of the board of education full reports of their respective schools according to forms prescribed by the superintendent and they shall not be entitled to their salaries until such reports are satisfactorily rendered."

You are requested to return to this office on or before May 15, 191.., a full report of your classification and estimate of the practical efficiency and the professional qualities of each of the teachers of your school, including kindergarten teachers, in accordance with the directions given below.

For a correct understanding of the brief headings of the columns, the following suggestions are made:

A. PRACTICAL EFFICIENCY.

1. *Management of children.*—This includes what is usually called the "discipline of the room," and also the general influence of the teacher's management on the development of character. Both the results and the methods of a teacher's management of the children should be taken into consideration. There may be, on one side, good order not based on fear of punishment, but brought about by a strong teacher's kindly influence over her pupils, and, on the other hand, there may be strict order attained by an unnecessary frequency of cases of discipline and a manifestation of caprice or unnecessary harshness.

2. *Instruction.*—A teacher's power to impart instruction should be judged both by the results accomplished and by the educational value of the methods of teaching. The principal should take into consideration the influence which her instruction has on the development of the children's intelligence, interest, self-activity, and progress. In case of the kindergarten teacher, principals will report under the head of "Instruction," her efficiency in the educational work of the kindergarten.

3. *Attention to details of school business.*—This includes the teacher's regularity of attendance (tardiness), accuracy, and neatness of record work, promptness in required reports, readiness to carry out directions (cooperation), the neatness of the room, and similar matters.

B. PROFESSIONAL QUALITIES.

4. *Scholarship.*—This includes the schooling received by the teacher, the general information which she possesses, and preparation for her special work.

5. *Professional interest and zeal.*—By this is meant the desire for self-improvement, the habit of reading good literature and of using the means of self-culture, which, through lectures and otherwise, the city offers. It includes professional progressiveness, attending teachers' meetings, etc.

6. *Personal qualifications.*—This report should show the general estimate which the principal places on the value of the presence and assistance of each one as a member of his corps of teachers. It includes the teacher's tact in dealing with parents and pupils and her general influence.

Each name should be placed in one of the following groups, viz: A, B, C, D. A means excellent; B, good; C, passable; and D, weak. C (passable) here means indifferent, ordinary, mediocre. Most new teachers should be classed C. Experienced teachers in this class can not be considered very satisfactory. The group

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letter must be placed in each column opposite the teacher's name to indicate her standing.

7. *Transfer.*—When a principal is dissatisfied with the work of a teacher and believes a transfer is advisable, the letter T should be placed in the fourth column. In such case the reason must be fully stated at the end of this report. No transfer should be indicated in this report for any cause other than dissatisfaction on the part of the principal with the work or management of the teacher. A principal should not recommend a transfer where the teacher, in his opinion, is inefficient and should be discontinued. In such case the word "Inefficient" should be placed in the last column.

Your attention is urgently directed to the necessity of making this report a candid statement, which is uninfluenced by any consideration except the wish to make it agree fully with the facts. A principal becomes alone responsible for the presence of unsatisfactory teachers in his school if he fails to report frankly his estimate of their work and qualifications.

Names.	Practical efficiency.			Professional qualities.			Group.	Request for transfer.
	Management of children.	Instruction.	Attention to details of school business.	Scholarship.	Professional interest and zeal.	Personal qualifications.		
1.....	.....	.....	.....	.....	.....	.....	.....	.....
2.....	.....	.....	.....	.....	.....	.....	.....	.....
3.....	.....	.....	.....	.....	.....	.....	.....	.....

LINCOLN.

The rating of the teachers in Lincoln, Nebr., is obtained by means of the following blank. Each teacher is rated by the five officials mentioned:

RATING OF TEACHERS.

....., 191 .

[A, excellent; B, good; C, fair; D, poor.]

..... Teacher .....Principal.

1. General estimate:
   By principal.....
   By supervisor of manual training.....
   By supervisor of art.....
   By supervisor of music.....
   By superintendent.....
2. Personality.....
3. Sympathy for pupils.....
4. Scholarship.....
5. Growth in efficiency.....
6. Loyalty to supervising officials and to fellow teachers.....
7. Spirit in which criticism is received.....
8. Ability to profit by criticism.....
9. Ability to instruct.....
10. Preparation of lessons.....
11. Ability to organize and discipline the school by proper methods.....
12. Dependableness in carrying out directions and regulations and in meeting the duties and obligations of the school.....

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13. Ability to secure the confidence and cooperation of parents.....
14. Does this teacher make such original and worthy contributions to the work of the schools that you consider her services exceptionally valuable?.....
15. Ability to use correct and effective English.....
16. Proficiency in "housekeeping".....
17. General attitude of pupils toward the work, duties, and obligations of the school..
18. Attention, application, and thoroughness of pupils in study and in recitation..
19. Ability of pupils to speak and to write acceptable English.....
20. Name special excellencies of this teacher.....
21. Give special needs.....
22. Do you recommend reelection?.....
23. Do you desire this teacher retained in your corps?.....
24. Under what conditions, if any, would this teacher do more effective work?....
.....
.....
25. Remarks.....
.....

SAGINAW.

In Saginaw, Mich., the teachers in division B (see p. 130 above) who are still on probation are rated both by the superintendent and the principal of the building. Teachers in division A are rated by the superintendent alone. The rating is done on the scale of 100.

The teachers in division B are rated on the following points: (*a*) Power to instruct; (*b*) power to inspire ambition in pupils; (*c*) power to secure moral conduct.

The teachers in division A are rated (1) on successful and satisfactory work, as determined by ability to teach, professional spirit, attitude toward the school and children, spirit of growth and desire to excel; (2) on completing annually, to the satisfaction of the superintendent and board of education, a course of reading approved by the professional study and examination committee. (In lieu of this course of reading, a certificate of attendance of not less than four weeks at an approved summer school will be accepted.)

WASHINGTON.

The instructions and blank for the rating of teachers in Washington, D. C., issued by Supt. A. T. Stuart, June 13, 1910, are as follows:

To the Supervising Officers:

Instructions for the rating of teachers.

I. In the normal, high, and manual training schools, all teachers, including special teachers doing service in such schools will be marked by the respective principals.

Principals of high and manual training schools should call upon the heads of departments for such information as they can furnish regarding the work of the teachers. It will not be necessary for heads of departments to mark teachers, but their advice will no doubt aid the principal in arriving at a fair estimate of the teacher's value.

Principals of normal, high, and manual training schools will also seek the aid of the directors of music, drawing, physical culture, manual training, domestic science, and domestic art in marking teachers in their schools in these subjects.

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II. In the elementary schools the supervising principals will mark all teachers within their divisions, including kindergarten teachers.

In the first four grades they will have conferences with the director or assistant director of primary work, and the mark given a teacher of these grades should represent the combined judgment of the supervising principal and the said director or assistant director.

In the four highest grades they will confer with the director of intermediate instruction and the mark given a teacher in these grades should represent the combined judgment of the supervising principal and the director of intermediate instruction.

In rating kindergarten teachers the supervising principals will confer with the director or assistant director of kindergartens before marking. The supervising principals will also call upon the special teachers of drawing, music, and physical culture to give such information as may aid in rendering judgment upon the teachers, in these subjects, within their division.

Directors and assistant directors of special work will mark the teachers in their departments excepting those assigned exclusively to normal, high, and manual training schools, who shall be marked by the principals of such schools after conference with said directors or assistant directors.

Directors of special studies will not mark grade teachers.

The director and assistant director of primary work will mark their respective assistants.

All supervising officers will be marked by the superintendent of schools.

REPORT ON OFFICERS AND TEACHERS TO THE SUPERINTENDENT OF SCHOOLS.

[This report is due on June 15.]

WASHINGTON, D. C., ... *19*..

Name.....School.....Grade.....

Teacher, principal, director, supervisor, special teacher, head of department.

[Check the official title of person reported upon.]

Graduate .....

[Name all schools issuing diplomas, or degrees, and give dates of graduation.]

Date of appointment in District of Columbia schools .....

Date of appointment to present position .....

Marks: Excellent, E.; Very good, V. G.; Good, G.; Fair, F.; Poor, P.; Very poor, V. P.

The marks excellent, very good, good, and fair are considered satisfactory and entitle the officer or teacher to the annual increase of salary provided by law. The marks poor and very poor are unsatisfactory and deprive the teacher of the annual increase of salary. A mark of very poor or two successive marks of poor will subject the teacher to a recommendation for removal for inefficiency.

Very good is the highest mark to be given to a teacher who has not had more than one year's experience.

Ability to teach.....

This includes: Home preparation; skill in planning lessons; methods of presentation; resourceful use of supplementary books and of other aids to teaching; power to inspire pupils with the spirit of work; results.

Ability to control.....

This includes: Force; tact; self-control; moral influence; methods of control; school order; conduct and general tone of pupils as shown in special classes, at recesses, or elsewhere when not under the eye of the teacher; general care of school and materials.

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Scholarship.....———

This includes: General education and culture; special training in preparation for teaching, fitness for position; the employment of systematic plans and methods for self-improvement; professional ambition and growth; special courses of post-graduate and other work.

Community interest.....———

This includes: Cooperation with other teachers and with supervising officers; willingness to receive suggestions, prompt obedience to instructions; interest and activity in the plans and aims of the school; leadership; harmonious relations with parents; useful participation in the affairs of the community—civic, philanthropic, educational, etc.

Executive ability.....(For supervisors and principals only).———

General rating.....———

(The general rating is not an average mark, but gives a judgment of the teacher's general efficiency.)

Signed.....

Position.....

Every rating is with reference exclusively to the position now held. The original is to be sent to the office of the superintendent. A duplicate is to be kept on file by the rating officer, which shall be shown to the teacher on request.

INDIANA.

In Indiana a law approved March 9, 1903, makes it the duty of the State superintendent of public instruction "to adopt and schedule the items entering into teachers' success grades," and it is the duty of the city, town, and county superintendents of schools each year to grade the "teachers under their charge and supervision" according to the schedule adopted.

The schedule prepared by Supt. R. J. Aley is as follows:

	Per cent.
The teacher	100
A. Teaching power	45
Many items enter into this, but the principal ones are preparation of lesson, skill in presentation, and results attained.	
B. Government	35
The teacher's power in government is shown in the general spirit of the school, and in the attitude the pupils take toward their daily tasks, toward each other, and toward the school property.	
C. General characteristics	20
Under this head the personality of the teacher, his professional and community interest, and all those qualities that make for the best citizenship should be considered.	

The schedule prepared by Supt. F. A. Cotton, Supt. Aley's predecessor, was considerably more elaborate than this. It is printed in the volume of the school laws of Indiana for 1907, pages 87–89.

This schedule for the items of success is necessitated by the minimum salary law in force in Indiana. The minimum salary is based by law on both the length of experience and the grades made for the certificate. The amount of salary per day is determined by multiplying a certain number of cents by the general average on the highest grade of license held by the teacher at the time of contracting. The

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number of cents to be multiplied is 2½ for beginners, 3 for those having had one year of experience, and 3½ for those having had at least three years of experience. After the teacher has taught one year, the success grade enters into the general average.

MARYLAND.

On or before the first day of October of each year the county superintendent shall submit to the county school board a list of all teachers employed, together with a classification of their certificates. In determining the class of the certificates the following points are to be considered: (*a*) Scholarship; (*b*) executive ability; (*c*) personality; and (*d*) teaching power. The county superintendent may add such other requirements as may be approved by the State board of education. (S. L., 1910, p. 32.)

This provision is necessitated by the minimum salary law passed in 1904 and amended in 1910. According to this law, no white teacher in the State shall receive less than $300 per school year. All white teachers holding first-class certificates and having taught three years shall receive at least $350, those having taught five years $400, and those having taught eight years $450. The minimum salary for white teachers holding second-class certificates and having taught eight years is $350. (S. L., 1910, p. 26.)

While these plans do not take into consideration the results of the teachers' work as revealed by examinations given to the pupils, it would be unfair to assume that these results are entirely omitted. They are included indirectly whenever methods of instruction and teaching ability are estimated, and no principal or supervisor familiar with the teachers' work could well fail to include them in even more direct ways.

The advantage of having a number of persons do the rating rather than having the superintendent or some other person do it alone is sufficiently discussed by Supt. H. B. Wilson in the description of the Decatur plan.

When the rating is done by at least three persons according to a carefully arranged plan, and especially when it is done confidentially, so that no one except the superintendent knows another's estimate, one would expect that the results of this method should prove quite satisfactory. But the following words from ex-Supt. E. G. Cooley, of Chicago, would lead one to think otherwise. Before drawing this conclusion, however, one would want to know what the Chicago plan of rating was and how it was administered. It may also be true that in cities like Chicago and Brooklyn, where teachers are carefully selected on entering the service, over 90 per cent are successful enough to deserve promotion.

The problems of stimulating schoolroom efficiency, intellectual growth, and scholarly zeal present serious difficulties to the supervisor. In making the estimate of schoolroom efficiency, we must endeavor to provide a system of recording efficiency that will be fair to the teacher, fair to the children, and not a perfect nightmare to the

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principal or other administrative officers responsible for making it. Sometimes this estimate has been made in percentages by the principal, supervisor, and district superintendent. It is difficult to protect the schools under this arrangement on account of the inclination of supervising officers to escape trouble by boosting the marks. According to the Brooklyn Eagle, a few years ago the marks of over 90 per cent of the teachers in Brooklyn were over 90 per cent. In Chicago, at the end of five years, in marking for promotion, it was found that 96 and a fraction per cent of the teachers were marked so high as to entitle them to promotion. It is evident that these estimates had ceased to discriminate properly between the degrees of efficiency of the teachers. In 1906 the board of education passed a rule requiring principals to mark all teachers as either "efficient" or "inefficient," thinking that this simple estimate would result in greater fairness to all concerned. Under this arrangement, after two trials, it appears that over 98 per cent were marked "efficient" and entitled to promotion. We found ourselves back where we began, with a flat rate for everybody, or with the clock doing the work. The rule has been abandoned and some modification of the percentage marking will again be employed. (N. E. A., 1907, p. 97.)

The interrelations of the various qualities of merit in teachers and their correlation with general teaching merit have recently been made the subject of an investigation by the writer in conjunction with Prof. G. D. Strayer of Teachers College, Columbia University.[1] Some of the results that we obtained are of interest in this connection and are given in the following extracts:

We decided, somewhat arbitrarily, to secure the following 14 items of data from a number of representative schools:

1. The teachers by grades, numbered consecutively.
2. The highest certificate, diploma, or degree held by each teacher.
3. Experience in years.
4. General teaching merit.
5. Health.
6. Personal appearance.
7. Initiative or originality.
8. Strength of personality.
9. Teaching skill; method.
10. Control or ability to keep order.
11. Ability to carry out suggestions.
12. Accord between teacher and pupil.
13. Progressive scholarship or studiousness.
14. Social factor outside of school.

Beginning with the fourth item, the item of general merit, the instruction was given to rank the teachers by number in their order of merit, placing the best teacher first, the next best second, and so on through the list. It was explicitly stated not to assign grades anywhere, but to give relative position only. As the typical ward school contains only from 8 to 12 teachers, we thought that this could be done quite readily. Cases of doubt we asked to be marked with a "D," but only a few collaborators took advantage of this.

The 14 items mentioned, together with the necessary instructions and explanations, we had mimeographed on paper of letter size. We placed each item at the head of a column and spread the items over two sheets, but this left ample room for the data requested. There was room for 25 names or numbers in each column without crowding.

[1] The qualities of merit in teachers; Journal of Educational Psychology, May, 1910, I, 271.

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The blanks thus prepared we submitted to the principals and supervisors of our acquaintance with the request that the data called for be furnished us. These officials responded with a fair degree of generosity and we are indeed appreciative of their assistance. They gave us in all 39 returns. Of these 39, we have used 26 in preparing this report. Four of the other 13 were improperly filled out, 4 others came from high schools, and 5 contained less than five teachers, which was the smallest number that we thought it safe to include.

The data collected obviously admit of a large number of correlations. The different items in each return can not only be correlated with general merit, but also with each other, and as there are 12 correlatable items in each return, this permits of 66 separate correlations for each blank, or 1,716 in all. While it might be worth while to make all these correlations, we made only 15 per sheet, or a total of about 390.

The correlations that we have made we have calculated by means of Woodworth's per cent of displacement. This method is rapid and requires only the relative positions of the units in the items compared. It notes the amount of displacement or agreement between the two orders. The possible results vary from 0 per cent to 100 per cent. Two orders that are alike give a 0 per cent of displacement, or perfect correlation, while two orders that are the reverse of each other give 100 per cent of displacement, or complete antagonism. Fifty per cent of displacement would mean no correlation, while the per cents from 0 to 50 indicate decreasing amounts of correlation, and those from 50 to 100, increasing amounts of antagonism.[1]

We have worked out a complete set of correlations with all the other items for general merit only, but we have also compared originality and the ability to carry out suggestions, and the strength of personality and accord, through all the papers, and we have made many other isolated correlations for sampling purposes.

The results of these correlations are condensed in the following table. This table gives the number of cases compared for each item, the range of the per cents of displacement, the median per cent of displacement, the average per cent of displacement, and the M. V. and the P. E. calculated from the average. The last column gives the figure obtained by transmuting the average per cent of displacement into the Pearson coefficient.

General merit and—	No. of cases.	Range.	Med.	Av.	M. V.	P. E.	Pearson.
3. Experience	25	10–60	29	32	11	8	36
5. Health	18	6–67	50	48	10	7	4
6. Appearance	24	10–61	44	40	10	7	20
7. Initiative	26	4–58	25	25	11	8	50
8. Personality	26	0–70	25	27	13	11	46
9. Teaching skill	26	0–70	17	23	15	13	54
10. Order	25	0–100	22	22	12	11	56
11. Following suggestions	24	0–50	25	29	10	10	42
12. Accord	26	0–60	33	31	10	10	38
13. Studiousness	24	0–53	30	28	12	11	44
14. Social factor	23	10–66	36	36	11	7	28
7 compared with 11	24	0–77	30	31	14	10	38
8 compared with 12	24	7–60	33	32	10	8	36

Both the M. V.'s, which vary from 10–15, and the P. E.'s, which vary from 7–13, make evident the fact that there was little central tendency shown in any of the correlations. The averages themselves vary from 22 to 48, with an average of the averages of 31. The medians are in close correspondence with the averages throughout, diverging more than four points in only one case. Positive correla-

[1] For a fuller account of this method of calculating coefficients of correlation, see Ruediger, The field of distinct vision, Science Press, N. Y., pp. 37–39.

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tions of medium degree are evident in all cases except one or, perhaps, two. The per cents of displacement between general merit and personal appearance show a median of 44 and an average of 40, with a P. E. of 7. This leaves a positive correlation of a very slight amount at best. The lowest correlation obtained exists between health and general merit, the average and the median being, respectively, 48 and 50. It should be said, however, that the figures in this item are the most unreliable of the entire table. Only 18 out of the 26 supervisors supplied the data for health, and a number of these expressed doubt regarding their ratings. The difficulty appears to be that the health of teachers, and of others as well, is not readily judged on the basis of anything short of a medical examination.

The highest correlations are found with teaching skill and with the ability to keep order, the medians and the averages being, respectively, 17 and 23, and 22 and 22. This may indicate that these items are the most important ones for successful teaching in the grades and that they should be given the greatest weight by supervisors in judging teachers.

The positive correlation between length of service and general merit is significant. The correlation is indicated by several other comparisons that we have made. The teaching experience of the 204 teachers for whom data were supplied under this head ranged from a fraction of a year to 34 years, with an average of 10 and a median of 8; 25 per cent had taught less than 5 years, while 26 per cent had taught over 14 years. The average and the median number of years taught by the teachers ranked first were, respectively, 14 and 10.5 years and for those ranked second 12 and 10.5 years. No teacher ranked either first or second had taught less than 5 years, and only 4 per cent had taught more than 25 years. The average number of years taught by those ranked lowest was 8 years and by those ranked second lowest 9 years. The medians for these were, respectively, 4.5 and 6 years. When the two oldest teachers are removed from the lowest group, the average drops to 6 years; and when the one oldest is removed from the second lowest group, the average drops to 8 years. These three teachers had taught, respectively, 24, 30, and 32 years; 70 per cent of the teachers in the first rank, 60 per cent of those in the second rank, 40 per cent of those in the second lowest rank, and only 30 per cent of those in the lowest had taught 10 years or more. This indicates either that teachers keep on improving and passing to higher ranks for at least 10 years or that the poorer teachers are gradually eliminated from the service. Both factors may play a part. From the figures as a whole one may infer that a teacher in the grades reaches first-class efficiency in about 5 years, that he maintains this efficiency for about 20 years, and that after about 25 years of service he begins to decline.

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PARTICIPATION OF TEACHERS IN THE DETERMINATION OF EDUCATIONAL POLICIES.

John Dewey, writing in the "Elementary School Teacher" for December, 1903, said:

> If there is a single public-school system in the United States where there is official and constitutional provision made for submitting questions of methods of discipline and teaching, and the questions of the curriculum, textbooks, etc., to the discussion and decision of those actually engaged in the work of teaching, that fact has escaped my notice.

While a statement like that can no longer be made, there appears at this time to be but one city in the United States where a beginning has been made at giving the teachers "official and constitutional" right to participate in determining the educational policies under which they are working. This city is Dallas, Tex. Under the leadership of Supt. Arthur Lefevre, a teachers' council was established in Dallas by the board of education in 1909. This council is described by Supt. Lefevre as follows:

> I propose that a teachers' advisory council be instituted, the council to be constituted of teachers in the schools for white children as follows: One representative elected by the teachers of each "grade" of the elementary schools; two principals of elementary schools elected by the principals; one representative elected by the faculty of each high school. This council should meet as occasions arise to hear all teachers who may desire to present their views; and the council should be required to file with the secretary of the board of education on or before the 1st day of June each year such report as it may choose on matters concerning the elementary schools or the system as a whole, addressed to the superintendent, but to remain intact in the records of the board and to be considered by the board in connection with the reports and recommendations of the superintendent.
>
> In addition to the representative council, the faculties of the high schools should be required to file in the same manner a report dealing with matters especially concerning the sphere of the high school.
>
> Independent reports from the principal of the main high school and supervisors and directors of special studies should continue to be made as heretofore.
>
> I recommend the adoption of a rule requiring that a teachers' advisory council be formed each year before the end of the third month in the manner and for the purposes described.[1]

Although Dallas, Tex., appears to be the only city in the United States in which the privilege and duty of making recommendations respecting educational matters has been conferred upon the teachers by the board of education, it does not follow that the teachers in other places are not allowed similar privileges in less official ways. Miss Shipp in making her study on elementary supervision for her master's essay at Teachers College in 1907 found that the teachers in 17 out of the 39 cities studied by her were allowed some part by the superintendent in making the course of study.

This administrative method of allowing the teachers a voice in educational questions has been most fully organized and established

[1] Texas school journal, May, 1909. Quoted from Supt. Lefevre's annual report.

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at Boston, Mass. There the teachers are allowed not only to take part in making the course of study, but also in determining other educational policies. The plan in operation is described as follows by Supt. Stratton D. Brooks in his annual report for 1909:

One grave defect in American education is the lack of any institutional method for the participation of teachers in the determination of major educational policies.

For the purpose of establishing such an institution the high-school councils have been created. In each high school the department meetings furnish opportunity for discussion participated in by every teacher concerned. Any problem may here be considered with reference to its effect upon both pupils and teachers, and each teacher can have his say. In the council meetings each high school is represented; and any modifications of the department decisions, made necessary by the interrelation of the high schools, may be determined. The recommendations of the councils are sent to the head masters' association, and here the questions are again discussed by the principals with reference to the broader lines of high-school administration that they may involve. Here, also, are representatives from each council, thus assuring that a recommendation from one council, say, that of English, shall be subjected to the critical consideration of representatives from every other council whose interests may be affected thereby. The conclusions of the head masters are in turn submitted to the board of superintendents, where they are again discussed with reference to their relation to the school system as a whole.

When a recommendation reaches the final authority—the school board—it does not represent the personal opinion of any teacher, principal, or superintendent. It may fall somewhat short of the best that has been proposed, but it is almost certain to be the best that is possible at that particular time and with that particular set of teachers. It represents intelligent and responsible participation of all interests in a decision that can be carried into effect by hearty cooperative effort.

For the elementary schools, the problem of permanent organization and of official recognition of a similar form of systematic participation of teachers in the determination of major educational policies is more difficult but fully as desirable. The enthusiasm and ability that have marked the deliberations of the various committees appointed during recent years give full assurance of the successful operation of such a plan when once established. It is hoped that, with the help of leading teachers in the elementary schools, a system of teacher participation may soon be devised that will retain for the Boston schools the advantages of initiative and individuality and secure for them the advantages of systematic organization and cooperative effort.

The teachers' organizations connected with this plan of cooperation that are mentioned in Supt. Brooks's report are the Boston Masters' Association, the Boston Head Masters' Association, the high-school councils (8), and committees of teachers (16). Each high-school council is free to consider such items of interest to its department as it chooses and makes recommendations to the Head Masters' Association, where one representative from each council is invited to be present to take part in the discussion of those matters that affect his department. The teachers' committees, which pertain mostly to the elementary schools, make their recommendations to the board of superintendents as a rule.

It is evident that both the Dallas and the Boston plans are merely advisory. They have no legislative functions which would appear

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to be necessary to any plan of teacher participation aspiring to completeness.

While the Boston plan is in some respects more thoroughgoing than that of Dallas, it can not be considered "constitutional," because it rests merely on the sanction of the superintendent. This gives it a large amount of insecurity, for the plan may lapse with a change of superintendents, an event that is far less likely to happen with a plan that has been established by the board of education. To give all the security and permanency that would be desirable, the plan should probably be established by the city council, if not by the State legislature.

A plan of teacher participation that appears to be still farther removed from official sanction than the Boston plan is in existence at New Britain, Conn. It is called the School Council of New Britain. This council appears to have been founded quite independent of the superintendent, who counts merely as one of the teachers. While this is a questionable basis for harmonious work in a teachers' council, it is nevertheless suggestive in that it indicates the need that teachers feel for taking part in shaping the policies under which they work.

The purposes of this council are stated as follows in the constitution:

1. To secure a more active and effective participation of the teachers in the professional direction of the schools.
2. To afford the largest possible opportunity for initiative on the part of the teacher.
3. To encourage professional improvement through study and discussion of important problems of education and school management.
4. To develop the sense of solidarity of the teaching body and an increasing appreciation of community of interest and responsibility among all teachers of all grades.
5. To furnish the teaching body a ready and effective means for the expression of its sentiments or opinions with reference to questions of school policy.

The by-laws provide for the following membership:

1. All principals, ex officio.
2. All supervisory officers and special teachers, ex officio.
3. One representative from each elementary grade, including kindergarten, to be elected by ballot by the teachers of the grade.
4. Two representatives from the high school, to be elected by the teachers of the high school.

As an agency for the improvement of teachers in service, the participation of teachers in the determination of educational policies should logically take high rank. It should furnish the motive for the efficient functioning of most of the other agencies that have been discussed. A teacher who has the duty and privilege of suggesting and defending changes in the course of study and in other educational policies would have a genuine motive for consulting school reports and for reading educational literature. Furthermore, the exercise of initiative and the bearing of responsibility would give added dignity and attractiveness to the teacher's calling.

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INDEX.

A.

After-hour classes, 54–55; colleges and universities, 55.
Alabama, teachers' institutes, 13.
Arizona, teachers' institutes, 14.
Arkansas, summer normal schools, 44; teachers' institutes, 13.
Associations, teachers. *See* Teachers' associations.

B.

Baltimore, promotional examinations, 117–120.
Barnard College, extension classes, 55–56.
Barnard, Henry, and teachers' institutes, 10.
Beers, S. P., on teachers' institutes, 10.
Boston, promotional examinations of teachers, 120–123; sabbatical year for teachers, 113–114.
Brashear fund, for teachers, 115.

C.

California, teachers' institutes, 14; teachers' meetings, local, 69.
Cambridge, Mass., sabbatical year for teachers, 113.
Cary, C. P., on summer schools, 43–44.
Certification of teachers, 111–113.
Chadsey, Supt., on promotional examinations of teachers, 136–137.
Chautauqua, lectures, 54.
Chicago, schoolroom efficiency of teachers, 139.
Chicago normal school, extension work, 57.
Chicago, University of, extension teaching, 54.
Cincinnati, promotional examinations of teachers, 123–125.
Classroom efficiency and success grades, teachers, 137–150.
Colleges and universities, after-hour classes, 55; correspondence study, 59, 60–63; summer schools, 50–53.
Colorado, summer normal school, 44; teachers' institutes, 12, 13, 15.
Columbia University, extension classes, 55–57.
Conferences, educational, 90.
Connecticut, teachers' institutes, 8.
Cooper, F. B., on promotional examinations of teachers, 136.
Correspondence schools, private, 64–65.
Correspondence study, 58–59; colleges and universities, 59, 60–61; normal schools, 63–64; University of Wisconsin, scope, 61–63.
County and sectional associations, 91–92.
County superintendents, conferences, 84–86; Florida, 85; North Dakota, 85–86; Wisconsin, 86.

D.

Decatur, Ill., schoolroom efficiency of teachers, 129–140; teachers' meetings, 80–82.
Delaware, teachers' institutes, 11, 14.
Denman, J. S., first to use name of teachers' institute, 10.
Dewey, John, on participation of teachers in the determination of educational policies, 151.
Dyer, F. B., on teachers' examinations, 124–125.

E.

Educational policies, determination, 151–153.
Extension and after-hour classes, 54–58.
Extension lectures, 53–54.
Extension teaching, lyceum and extension lectures, 53–54.

F.

Federation of State teachers' associations, 88–90.
Florida, county superintendents' conferences, 85; summer normal school, 44.

G.

Georgia, teachers' institutes, 13, 14.
Greenwood, J. M., on promotional examinations of teachers, 136; on teachers' examinations, 125–126.

I.

Idaho, summer schools, 45; teachers' institutes, 12.
Indiana, teachers' institutes, 29; teachers' institutes, programs, 19–20, 24–25; teachers' meetings, local, 69–72; teachers' success grades, 146–147.
Iowa, teachers' institutes, 13.

K.

Kahn fund, for teachers, 116.
Kansas, summer normal schools, 44; teachers' institutes, 15, 27.
Kansas City, promotional examinations of teachers, 125–126; rating of teachers, 142–143.
Kentucky, teachers' institutes, 13, 15, 28; teachers' meetings, local, 72.

L.

Lincoln, Nebr., promotional examinations of teachers, 126–127; rating of teachers, 143–144.
Louisiana, summer normal schools, 45; teachers' institutes, 14, 16, 26; teachers' meetings, local, 72–74; teachers' reading circles, 98.
Lyceums, 53–54.

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M.

McCoy fund, 115.
McManis, J. T., problems of the institute, 30.
Maine, summer normal schools, 46; teachers' institutes, 15.
Mann, Horace, and teachers' institutes, 10-11.
Maryland, rating of teachers, 147-148; teachers' institutes, 14, 16, 17; teachers' reading circles, 98.
Massachusetts, teachers' institutes, 8, 15, 25-26.
Maxwell, W. H., on promotional examinations of teachers, 127-128.
Michigan, teachers' institutes, 12, 16; teachers' institutes, programs, 18-19.
Michigan State Normal School, extension work, 58.
Minnesota, summer normal schools, 46; teachers' institutes, 14; teachers' meetings, local, 74.
Mississippi, teachers' institutes, 13, 16.
Missouri, teachers' institutes, 11-12, 14, 26.
Montana, teachers' institutes, 26.

N.

National education association, 88.
Nebraska, summer normal schools, 46-47; teachers' institutes, 12, 13, 16, 17.
Nevada, teachers' institutes, 11, 12.
New Hampshire, teachers' institutes, 9, 16.
New Jersey, summer normal schools, 47; teachers' institutes, 14.
New Mexico, teachers' institutes, 15.
New York, teachers' institutes, 12, 13, 17, 27.
New York City, promotional examinations of teachers, 127-128.
Normal schools, correspondence study, 63-64; extension work, 57-58; State, summer sessions, 49-50.
See also Summer normal schools.
North Carolina, teachers' institutes, 11, 15, 16, 17, 26, 27.
North Dakota, county superintendents' conferences, 85-86; summer normal schools, 47; teachers' institutes, 11, 26; teachers' meetings, local, 74; teachers' reading circles, 98.

O.

Official teachers' gatherings, 7-41.
Ohio, teachers' institutes, 13, 15, 26, 27.
Oklahoma, teachers' institutes, 13, 15; teachers' reading circles, 98.
Oregon, teachers' meetings, local, 75.

P.

Paterson, N. J., promotion of teachers, 129-130.
Pennsylvania, teachers' institutes, 13, 14, 26, 27.
Phillips, J. H., on promotional examinations of teachers, 136.
Principals' meetings, 90-91.
Promotional examinations of teachers, Baltimore, 117-120; Boston, 120-123; Chicago, 123-124; general discussion, 135-137; Kansas City, 125-126; Lincoln, Nebr., 126-127; Saginaw, Mich., 130-133; Springfield, Ohio, 133-134.
Promotions, teachers, classroom efficiency and success grades, 137-150; merit system, 116-150.
Pupils' reading circles, 109.

R.

Reading circles. *See* Teachers' reading circles; pupils' reading circles.
Rhode Island, teachers' institutes, 9.

S.

Sabbatical years, 113-115.
Saginaw, Mich., promotional examinations of teachers, 130-133; rating of teachers, 144.
Schmidlapp fund, for teachers, 115.
Seerley, H. H., on practical value of the institute system, 31.
Smith, G. T., on promotional examinations of teachers, 136.
South Dakota, teachers' institutes, 13, 14, 15; teachers' meetings, local, 75; teachers' reading circles, 98.
South, the, and teachers' institutes, 11.
Springfield, Ohio, promotional examinations of teachers, 133-134.
State associations, teachers, 90.
State Normal School, Springfield, Mo., extension work, 58.
State normal schools. *See* Normal schools, State.
Strayer, G. D., on general teaching merit of teachers, 148-150.
Summer normal schools, 42-53; Arkansas, 44; Colorado, 44; Florida, 44; Idaho, 45; Kansas, 44; Louisiana, 45; Maine, 46; Minnesota, 46; Nebraska, 46-47; New Jersey, 47; North Dakota, 47; Tennessee, 47; Texas, 48; Vermont, 48; Virginia, 48.
See also Normal schools, State.
Summer schools (Cary), 43-44; colleges and universities, 50-53.
Superintendents' meetings, 90-91.

T.

Teachers, merit system of promotions, 116-150; printed aids for, 109-111; promotional examinations, 123-124, Baltimore, 117-120, Boston, 120-123, Cincinnati, 124-125, Kansas City, 125-126, New York City, 127-128, Saginaw, Mich., 130-133, Springfield, Ohio, 133-134, Paterson, N. J., 129-130, Washington, D. C.; visiting days, 82-84.
Teachers' associations, 86-88; county and sectional, 91-92; discussion, 7-8; federation of State organizations, 88-90; list, 85; national, 88; State, 90.
Teachers, certification, 111-113; classroom efficiency and success grades, 137-150; determination of educational policies, 151-153; funds for, 115-116.
Teachers College, Columbia University, extension classes, 56-57.
Teachers' institutes, 7-41; Alabama, 13; Arizona, 14; Arkansas, 13; attendance, 13-14, 26-27; (by States) statistical table, 34-41; California, 14; Colorado, 12, 13, 15; compulsory attendance, 13, 14; Connecticut, 8; Delaware, 11, 14; function and probable destiny, 27-32; Georgia, 13, 14; history, 10-11; Idaho, 12; illustrative programs, 18-26; Indiana, 13, 29; instructors, 15-18; in the South, 11; Iowa, 13; Kansas, 15, 27; Kentucky, 13, 15, 28; Louisiana, 14, 16, 26; Maine, 15; Maryland, 14, 16, 17; Massachusetts, 8, 15; meetings, and summer normals, statistics, 34-41; methods of securing

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instruction, 15-18; Michigan, 12, 16; Minnesota, 14; Mississippi, 13, 16; Missouri, 11-12, 14, 26; Montana, 26; Nebraska, 12, 13, 16, 17; Nevada, 11, 12; New Hampshire, 9, 16; New Jersey, 14; New Mexico, 15; New York, 13, 17, 27; North Carolina, 11, 15, 16, 17, 27; North Dakota, 11, 26; Ohio, 13, 15, 26, 27; Oklahoma, 13, 15; Oregon, 14; Pennsylvania, 13, 14, 26, 27; practical value (Seerley) 31; present status, 11-18; problems (McManis) 30; requiring fees from teachers for support, 14-15; Rhode Island, 9; South Dakota, 13, 15; time of meeting, 13; Utah, 16; value, 31-32; Texas, 13, 14, 26; Vermont, 9; Washington, 14, 26, 27; West Virginia, 11, 13, 28-29, 76; Wisconsin, 11, 15, 16, 27; Wyoming, 14.

Teachers' meetings, 7-41; in cities, 77-82; local, California, 69, Indiana, 69, Kentucky, 72, Louisiana, 72-74, Minnesota, 74, North Dakota, 74, Oregon, 75, South Dakota, 75, Utah, 75, Virginia, 75, Washington, 76-77; frequency and length, 68; functions, 65-68; rural districts, 65, 68, 69.
See also Teachers' institutes.

Teachers' reading circles, 92-93; books used, composite picture, 102-107; books used in Illinois, Iowa, Maryland, North Carolina, Washington, 101; (by States) statistical table, 94-97; extracts from current bulletins, 100-101; functions, 108-109; Louisiana, 98; Maryland, 98; North Dakota, 98; Oklahoma, 98; South Dakota, 98; West Virginia, 99-100.

Tennessee, summer normal schools, 47.

Texas, teachers' institutes, 13, 14, 26; summer normal schools, 48.

U.

Utah, teachers' institutes, 16; teachers' meetings, local, 75.

Universities, correspondence work, scope, 61-63.

University summer schools, statistics, 52.

V.

Van Sickle, J. H., on promotional examinations of teachers, 117-120.

Vermont, summer normal schools, 48; teachers' institutes, 9.

Virginia, summer normal schools, 48; teachers' meetings, local, 75.

Visiting days, for teachers, 82-84.

W.

Washington, D. C., promotions of teachers, 134-135; rating of teachers, 144-146.

Washington, teachers' institutes, 14, 27; teachers' meetings, local, 76-77; teachers' meetings, 26.

West Virginia, teachers' institutes, 11, 13, 28-29; program, 20-24; teachers' meetings, local, 76; teachers' reading circles, 99-100.

Winona, Wis., teachers' meetings, 80.

Wisconsin, county superintendents conferences, 86; teachers' institutes, 11, 15, 16, 27.

Wisconsin, University of, correspondence work, scope, 61-63.

Wyoming, teachers' institutes, 14.

O

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REPORT OF THE COMMISSION APPOINTED TO STUDY THE SYSTEM OF EDUCATION IN THE PUBLIC SCHOOLS OF BALTIMORE

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CONTENTS.

	Page.
Letter of transmittal	5
Members of the commission	6
Letter to the Board of School Commissioners—Summary	7
Chapter I.—History and Method of the Study	16
The appointment, organization, and work of the commission	16
Limits of the study	18
The method of the study	20
Chapter II.—Preliminary Topics	22
The recent history of city school systems	22
History of the Baltimore system and general statistics of the city of Baltimore	24
The legal basis of the system	28
Financial support of the system	33
Scope and organization of the system	44
Chapter III.—The Main Topics of this Report, relating to training and instruction in elementary day schools	48
A. The system of supervision	48
Conditions in the past	48
Present policy and practice	49
Criticism	51
Recommendations	53
B. The teaching force and its training	55
Conditions in the past	55
City training schools	55
Admission to the eligible list	57
Promotional examinations	57
Criticism and recommendations	59
Character of the teaching in general	62
C. The elementary school curriculum	63
Historical summary	63
Methods employed in making course of study	64
Time allotments	65
Subjects in detail:	
The language, or English, group	66
Mathematics	71
Geography	78
Nature study	82
History	83
Drawing	84
Physiology and hygiene	84
Conduct of instruction	87
Teaching method	88
Sectional teaching	88
Coeducation of the sexes	90

Digitized by Google

Chapter IV.—Subsidiary Topics. Page
The school plant 92
The attendance of pupils 92
The health of pupils 100
The control and discipline of pupils 101
Chapter V.—Additional Views and Suggestions.
General considerations 102
Supplementary suggestions 106
INDEX 111

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, June 20, 1911.

SIR: On the 7th of February of this year I addressed to the Secretary of the Interior the following letter:

"I have the honor to transmit herewith a communication from the chairman of the committee on rules of the board of school commissioners of Baltimore city, informing me of the action of that board in providing for the appointment of a commission to investigate and report upon the system of education now in force in the public schools of that city, and requesting me to become the chairman of such commission. I would respectfully request your opinion as to the question whether I may properly accept this invitation.

"I may say that, on careful consideration of this communication from the Baltimore board of school commissioners, my own judgment inclines strongly to the view that the proposal is in accord with the statutory functions of the Commissioner of Education, and that the rendering of such service as is requested is one of the ways in which this office can most effectively collect 'such statistics and facts as would show the condition and progress of education' and diffuse 'such information respecting the organization and management of schools and school systems, and methods of teaching, as shall aid the people of the United States in the establishment and maintenance of efficient school systems, and otherwise promote the cause of education throughout the country.' I am accordingly disposed to accept the invitation if in your opinion I may properly do so. It is understood that I could not accept compensation from the school authorities of Baltimore for any such service, nor receive from them any payment other than a reasonable allowance for personal expense incurred in making the inquiry."

This letter was returned to me with the following indorsement:

"Approved February 8, 1911.

"Such engagement not to interfere with the official duties of the commissioner.

"R. A. BALLINGER, *Secretary*."

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The work of the commission referred to has now been completed and its report is ready for publication. This report, in the preparation of which the commission has been largely assisted by the staff of two divisions of this bureau, is mainly concerned with a comparison of the Baltimore system of education with the systems found in others of our greater American cities. It seems to me that it will accordingly be of very general interest to educational authorities and students of education throughout the country. I beg, therefore, to recommend that it be published as one number of the bulletin of the Bureau of Education, and have the honor to transmit the manuscript herewith for such publication.

Very respectfully, ELMER ELLSWORTH BROWN,
Commissioner.

The SECRETARY OF THE INTERIOR.

THE COMMISSION.

Members:

Elmer Ellsworth Brown, Commissioner of Education of the United States, Washington, chairman of the commission.

Ellwood P. Cubberley, professor of the theory and history of education in the Leland Stanford Junior University.

Calvin N. Kendall, superintendent of schools, Indianapolis, Ind.

Assistants:

Milo B. Hillegas, chief of the editorial division, Bureau of Education, Washington, secretary of the commission.

Harlan Updegraff, chief of the division of school administration, Bureau of Education, Washington.

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REPORT OF THE COMMISSION APPOINTED TO STUDY THE SYSTEM OF EDUCATION IN THE PUBLIC SCHOOLS OF BALTIMORE.

LETTER TO THE BOARD OF SCHOOL COMMISSIONERS.

BALTIMORE, MD., *June 1, 1911.*

The BOARD OF SCHOOL COMMISSIONERS.

GENTLEMEN: Your commission appointed to inquire into the system of instruction in the public schools of Baltimore has the honor to present herewith a report of such inquiry. In so doing, we beg to call attention at the outset to those observations and recommendations which seem to us of chief importance. This letter accordingly presents the main outcome of our inquiry. The subjects here mentioned are discussed at greater length in the pages which follow, along with many others which have seemed to us worthy of consideration.

It will be remembered that the commission was charged with an inquiry touching only the educational side of the city school system. The business side has received notice only in so far as has seemed necessary to an understanding of the system of instruction. On the educational side, too, those topics have received chief attention which have appeared to be of chief significance in the Baltimore situation, leaving other important topics for only incidental treatment. An exhaustive study of so large a system of schools would have required a much longer time than that which we have had at our disposal. As it is, some parts of our work have had to be done too hastily. Join to this the fact that we have had to proceed with no well-defined precedents for our guidance, and it will appear that there is some ground for indulgence if defects are found in our report.

It should be added, however, that within reasonable limits every effort has been put forth to make this inquiry thoroughgoing and comprehensive. At our request, the time originally proposed for its completion has been extended by some weeks. The members of the commission and their assistants have given close personal attention to the matters coming under consideration, having spent much time in Baltimore for this purpose and having made many comparisons with the educational systems of other cities. The methods which we have pursued are described more particularly on pages 20–21 of this report.

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In arriving at conclusions and making recommendations, our aim has been, as far as possible, to avoid presenting mere opinions of our own, and to set forth instead conclusions drawn from the most fruitful experience of other American cities.

SUMMARY.

(1) As regards the outward organization of its educational affairs, under the charter of 1898, Baltimore shows elements both of strength and of weakness. On the whole, however, the school provisions of that charter are of the better class, and offer a reasonable opportunity for effective school administration. We have received from many sources the information that under the earlier form of organization, with a large board of school commissioners elected by wards, the school affairs of the city were involved in local and partisan politics. There is abundant evidence that conditions have changed for the better under the charter provisions now in force. It would carry us beyond the proper scope of this report to point out particulars in which those provisions might still be improved. But what is of chief importance here is that we call attention to the danger, always present, even under improved forms of administration, of a return to pernicious political conditions. The health of a system of schools depends upon the fidelity of that system to the interests of the whole community, quite apart from private and factional interests. To keep the schools on this high plane of public service, above all partisanship, is the first concern of those charged with their administration.

(2) The expenditures for education in the city of Baltimore are relatively low. It is to be remembered when adverse criticism is presented in this report that the operations under review have been conducted on a comparatively narrow allowance of public funds. At certain points, chiefly those touching supervision, the salaries of teachers, and elementary school buildings, the recommendations which we present involve an increase of expenditures. We have, however, refrained from suggesting any increase which would carry the expenditures for the school department of Baltimore above the expenditures for the schools of other cities of approximately the same population, or above the average per capita expenditures for education in the larger cities of this country.

(3) The net result of our inquiry into the system of education is an opinion favorable to that system. While we find much to criticize adversely, we have taken into account the historical development of the system and its very moderate cost at the present time. In view of these considerations, we are justified in rendering a report which, in its main outlines, is positively favorable. With reference to any

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school system the important thing is not so much the question, What is its present status? as that other question, Is it moving in the right direction? It is clear to us that, under the charter of 1898, in spite of certain particulars in which changes are still called for, the general movement in Baltimore has been unmistakably in the direction of improvement. We have, in fact, been repeatedly struck with admiration for progress which has been made in the face of more than ordinary difficulties.

It seems to us that this forward movement in Baltimore has been checked of late by those controversies which are a matter of common knowledge. The many personal bearings of such controversies, which apparently constitute a considerable element in the actual situation, lie outside of the field of this inquiry, and your commission has endeavored to keep entirely clear of all such considerations. We have become convinced, however, that an urgent need of the school system is the united support of the community. The aims and plans of the school authorities, as well as the measure of success that has thus far been attained in carrying those purposes into effect, are worthy of the confidence of the people of Baltimore. Such recommendations as are made independently in this report are found to be in general accord with the present policies of the school administration and point in the direction of a rational development of those policies.

Some measure of difference of opinion respecting any school system is always to be expected. When controversy becomes embittered, however, it not only arrests the progress of improvements and accentuates reactionary tendencies, but in particular it increases the danger that the schools will be brought into political entanglements. We call repeated attention to this danger, because we believe it is a vital consideration in any public-school system.

(4) In its general scope the school system calls for approval. Expenditures have been concentrated upon what may be called the central core of the system, the ordinary elementary and high schools, and very little has gone to extensions and appendages of the school system. We do not commend the Baltimore system for the relatively slight attention which it has devoted to the so-called "wider uses of the school plant," but we do regard it as good judgment on the part of the school authorities that, so long as the funds available for the schools have been relatively low, they should have been employed for ordinary school purposes.

In the time at our disposal, it has been impossible to make any examination of the City College, the high schools, and the Polytechnic Institute. We have visited a number of the schools for colored people, but have been unable to give attention to the special questions which relate to such schools.

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Within the scope of the ordinary elementary schools, important provision has been made for variety in the instruction and training offered, to meet the various needs of pupils. We refer particularly to the variety of needs which grows out of a variety of abilities. We know of no system of schools in which better provision is made for pupils of more than ordinary ability than that which Baltimore offers in the so-called preparatory classes. After observing these classes and considering the arguments concerning them, both pro and con, we are unanimous in regarding them as among the best features of the Baltimore system. The provision which is made for backward pupils and for pupils who are hard to govern, as well as for habitual truants, calls in the main for decided commendation.

One provision which has been a subject of controversy should be mentioned here, namely, that relating to the so-called sectional teaching. This is an arrangement by which, in a portion of their studies, the pupils under one teacher are not taught as a single class but are divided into two groups. The arguments for and against this practice have been admirably summed up in the superintendent's annual report of the New York City schools for the year 1910 (see Appendix A). We agree with Supt. Maxwell in his favorable judgment regarding the group or sectional plan. We have found in different schools in Baltimore a wide divergence among teachers and principals in their understanding of the present requirements as to sectional teaching. It would seem to us probable that the opposition to that system would disappear if the regulations, both nominal and implied, were more generally understood. This is one point out of many in which we have found a larger provision for school supervision desirable.

(5) The system of school supervision has received particular attention. We regard the supervision of schools as a means of helping the class teachers and increasing their efficiency. Where the supervisory force is small the members of the board of superintendents can meet the individual teachers only at long intervals, and supervision must be too largely carried on through general orders and directions. These are liable to misunderstanding. As a consequence supervision by a small staff of superintendents is sometimes felt as repressive and onerous, where supervision directed to the same ends by a fairly large and efficient staff would be found altogether helpful. In comparison with other cities Baltimore appears to be provided with an insufficient corps of supervisory officers.

At the time of its adoption, the division of the schools into groups, each of which was placed in charge of a group principal, was manifestly a wise and useful arrangement. It still serves a useful purpose, and we recommend that it be modified only by a gradual process. It provides for supervision by "vertical" divisions; that is, one

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group, embracing all of the elementary grades from the first to the eighth, under a single head, stands side by side with a similar group, and the same arrangement is repeated throughout the city. This system is supplemented with supervision by "horizontal" divisions, as in the case of certain special subjects, music, drawing, and others, the supervisor of instruction in one of these subjects having relations with the teachers in all of the groups so far as they are concerned with teaching that subject. We recommend an increase in the amount of such "horizontal" supervision. Whether by special subjects or by certain grades in the schools or by any other convenient arrangement, such supervision should bind the different groups together in a common understanding of a common work.

This will involve a moderate increase in the number of assistant superintendents or of supervisors in special subjects or of both. It is of the utmost importance that the city should secure for such positions the persons best equipped, by native endowment and by professional training and experience, that can be had in any part of this country.

With the development of such a supervisory body it may be found desirable to replace the group-principal system with provision for a supervising principal in each school building. Such a change, however, must depend in many instances upon the erection of large schoolhouses in place of the small and unsuitable buildings which are now in common use.

(6) As regards the teaching staff, there are aspects of the situation in Baltimore which call for careful consideration. Under existing charter provisions the teachers have permanent tenure of their positions. While they may be dismissed for cause, the prescribed procedure is such as to render dismissal practically impossible save in extreme cases. Such an arrangement has its advantages, particularly when it protects a sifted body of trained and competent teachers. Here it has been applied to a body of teachers the great majority of whom were appointed to positions in the school department under the conditions obtaining before the present charter provisions went into effect, and upon a requirement of only the most meager preparation.

The teaching body as we have seen it, even leaving out of account those members appointed under the requirements now in force, is much better than those earlier requirements might lead one to expect. We have seen teachers in Baltimore whose work would rank with the best with which we are familiar, and we are glad to pay honor to the service they are rendering. But alongside of much that is good and some of it extremely good, there is much that we should regard as poor and much more that, at best, is of mediocre quality. In this matter, it is not sufficient to have a high average, the low grade of

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efficiency at one point being offset by a high grade of efficiency at another point. The pupils under the teacher of low efficiency are not helped by the fact that there is high efficiency somewhere else. It is a high general level of efficiency that the school administration must seek to establish and maintain. It has seemed to us that much of the complaint which has come from the parents of school children in Baltimore is caused by the imperfect work of the weaker members of the teaching force, who are practically secure in their positions, under the conditions referred to above.

It is not to be forgotten that what is needed in a modern teaching body is not only efficiency but progressive efficiency. The requirements in teaching are changing from year to year as are the requirements in other fields of activity. A body of public-school teachers should be so well trained, both professionally and in general, that they can carry forward a program of continuous educational improvement.

So far as the future is concerned, this requirement is fairly well met by the higher standard which has been set for entrance upon a teaching position, and by provision for the preparation of teachers in city training schools. As was noted above, the more efficient of the teachers appointed in earlier years are doing good work. The problem which has confronted the educational authorities has been that of raising the general level and of raising the minimum level of the less progressive and efficient portion of the corps of teachers.

Closely connected with this problem is the question concerning the salaries of the teachers. We have no hesitation in expressing the opinion, based on the experience of other cities, that the present scale of salaries is too low. This seems to us so clear as to call for no extended discussion at this point.

The commission regards promotional examinations as a proper and serviceable method looking to the improvement of a body of teachers, many of whom are below a reasonable standard for the present day as regards general and professional education. It is not the only method to that end, but is probably as effective, under ordinary circumstances, as any that might be employed. We see no reason accordingly to condemn the system in principle. The real question regarding its employment in Baltimore seems to us merely the practical question as to how far it can be made to work. The fact that a majority of the Baltimore teachers are opposed to it and that this opposition has produced something like a deadlock, in that many of the teachers have even sacrificed a chance for an increase of salary rather than take the examinations, seems to us, accordingly, to present not so much a question of principle as a question whether better results can be secured by a modification of the method.

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There is, however, a fundamental principle back of the whole matter, and that is the principle that, for the good of the whole people, the teaching force of the city should be made as effective as possible. It seems to us that the educational authorities of the city, on the one hand, and those teachers who are opposed to the promotional examinations, on the other hand, agreeing upon this fundamental principle, should come to agreement as to the methods of carrying it into effect; and that on both sides there should be a readiness to make some concessions with a view to such agreement. It is reasonable to expect that such agreement may be reached when both sides are seeking the same end, and it is worth while to make every effort to accomplish this result. Failing in that, the board of school commissioners, in whom the legal responsibility for the conduct of the schools is reposed, should adopt and carry into effect such regulations as may seem to them to meet the case; and in so doing they should have the general support of the community and the support of the teachers themselves.

Various circumstances combine to give to the training school for white teachers a position of unusual influence in the school system. This is a situation which has been turned to the advantage of the schools in a variety of ways, and can be made of still greater advantage. As soon as practicable the training school should be adequately housed and equipped. Its management and that of the corresponding school for colored teachers, together with the oversight of the work of substitute and probationary teachers, might with profit be unified and given a large place in a general plan for the more adequate supervision of the schools.

(7) One striking instance has come to our notice in which the Baltimore teachers have been individually consulted regarding an important question of general policy, in cooperation with the supervisory officers and the staff of the training school for white teachers. That is in the framing of the present courses of study. While many criticisms of these courses have appeared, we find on careful comparison that they do not differ greatly from the courses now followed in others of our large American cities. On the whole, the Baltimore courses appear from such comparison to be moderately conservative. They devote somewhat more than the average time to the old and universally recognized subjects of instruction, including reading, writing, and arithmetic. Certain minor particulars are noted in which they seem to deviate unduly from the general practice of the present time, as in the relatively large amount of time devoted to the study of common fractions. The changes which have been made in these courses in recent years do not seem to have been more numerous or extensive than those which have been made in other cities.

About an average amount of experimentation with new plans and materials, as well as new methods, has taken place, and the general

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trend in these changes and experiments has not varied greatly from that in the country at large. This is well illustrated in the case of English grammar, concerning which there has been adverse criticism. The formal study of this subject has changed in Baltimore very much as it has changed in other American cities. That is, it has here as elsewhere come more and more to be restricted to the upper grammar grades.

Nearly a generation ago Baltimore was among the first of American cities to introduce manual training into the schools. The time now devoted to such training is not unreasonable in amount, being only a little above the average for the larger American cities. As yet Baltimore has made only a slight beginning in the more strictly industrial training. We regard it as desirable that experimentation in this difficult and important branch of the newer education should be carried steadily forward, but not too rapidly for a careful appraisement of results and methods.

(8) With occasional exceptions we have found the order and government of the schools deserving commendation. We should judge from what we have seen that the ordinary and traditional relations between pupils and teachers are good. We can not pass an opinion, from personal observation, upon the more difficult and critical aspects of the government of the schools, inasmuch as the most troublesome pupils seldom show their worst side when visitors are present. On general principles we should not advise the restoration of the rod as a means of discipline. It may, however, be found advisable to make its use permissive, under proper safeguards, in the rooms provided for pupils who are more than ordinarily hard to govern, where it may offer one more "last resort" in dealing with really insubordinate pupils. Even if its use should be permitted in these special rooms, the best teachers of such classes would have recourse to it but rarely.

The subject of coeducation of boys and girls has not, so far as we can learn, aroused such serious question in other cities as has recently been raised in Baltimore. The preponderance of American opinion seems to be very markedly on the side of coeducation in both primary and grammar schools. In the absence of any well-ascertained information which would show plainly that coeducation in these grades presents fewer advantages and greater evils than separate education, we can not advise the transformation of the mixed schools into schools in which the sexes are separated. Public schools of both types exist in Baltimore to-day. Considerable expense would undoubtedly be involved in the attempt to reduce all of these to the one type of the school in which boys and girls are separated, and such expenditure must inevitably delay improvement in other directions where the need of change is more manifest.

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(9) Finally, attention should be called to the unsatisfactory condition of many of the schoolhouses. Baltimore is not the only city that is at fault in this respect, and the newer schoolhouses of Baltimore mark a great improvement over the old. We should not be excusable, however, if we failed to call attention to the serious condition of many of the older buildings as regards danger from fire and their unsuitable and insanitary character in general.

The commission has been harmonious throughout, and it presents a unanimous report. With only negligible exceptions we have been treated with the utmost courtesy by all of those with whom we have had to do in the course of this inquiry. We desire to return our thanks for all of these courtesies. On our own part we have endeavored to give full and impartial consideration to all information and suggestions which have come to us, from whatever source. It has been our single purpose to aid the city of Baltimore, as represented by its board of school commissioners, in the effort to make the city system of schools as efficient as possible. We have become convinced that a highly efficient system may be built up, from the beginnings already made, by measures of constructive improvement, such as we have outlined in part, rather than by any revolutionary procedure.

All of which is respectfully submitted.

ELMER ELLSWORTH BROWN,
ELLWOOD P. CUBBERLEY,
CALVIN N. KENDALL,
Commission.

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CHAPTER I.

HISTORY AND METHOD OF THE STUDY.

THE APPOINTMENT, ORGANIZATION, AND WORK OF THE COMMISSION.

On January 25, 1911, the board of school commissioners of the city of Baltimore adopted the following resolution:

"Whereas the committee on rules, curriculum, and textbooks of this board has heretofore been charged by this board with the duty of considering the curriculum now in effect in the public-school system of this city; and

"Whereas it is the sense of this board that for the purpose of assisting the committee in its labors it is advisable that a commission shall be appointed to investigate and report upon the system of education now in force in the public schools of this city:

"*Resolved*, That the committee on rules, curriculum, and textbooks be, and it is hereby, directed to employ a commission of three disinterested, competent persons to investigate and report upon the system of instruction now in force in the public schools of Baltimore City and to spend a sum not exceeding $2,000 for this purpose."

After an informal conference between the Commissioner of Education and Gen. Lawrason Riggs, president of the board of school commissioners of Baltimore, and Mr. George A. Solter, chairman of the committee on rules, textbooks, and curriculum, held in Washington January 27, 1911, the chairmanship of the commission was tendered to the Commissioner of Education by letter dated January 31, 1911, and was accepted by him by letter dated February 10, 1911. The correspondence referred to is as follows:

BALTIMORE, MD., *January 31, 1911.*

Dr. ELMER E. BROWN,
United States Commissioner of Education,
Washington, D. C.

DEAR SIR: In conformity with our interview on last Friday, I inclose you herewith a copy of the resolution of the board of school commissioners of this city, providing for the appointment of the commission of which we spoke to you.

It is the earnest desire of the committee on rules and curriculum that you accept the chairmanship of this commission, which we hereby respectfully tender to you, and as you spoke so highly of the attainments of Mr. E. P. Cubberley, we respectfully suggest him as one

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of the members of the commission, and that you and Mr. Cubberley decide upon the third member.

We are asking that this commission make a study of the curriculum and methods of instruction now obtaining in our schools, with a view of determining how they conform to the established standards in other large cities in this country. We feel that this study will be beneficial, not only to us but to all other cities in the country, and that a report thus made by skilled and unbiased experts will become a valuable document to be used by your department.

The appropriation is to be devoted to the payment of the members of the commission for their services, and the expense incident to making this study and the disposal of it will be left to the commission itself.

We sincerely trust that you will see your way clear to accept the position, and we beg to assure you that we will do everything possible to facilitate and make pleasant the work of the commission.

I am, believe me,

Very truly, yours,

GEORGE A. SOLTER,
Chairman of the Committee on Rules,
Board of School Commissioners of Baltimore City.

WASHINGTON, *February 10, 1911.*

Mr. GEORGE A. SOLTER,
600 Maryland Telephone Building,
Lexington and Courtland Streets,
Baltimore, Md.

MY DEAR MR. SOLTER: I beg to acknowledge the receipt of your letter of January 31, and to say in reply that, after due consideration and consultation, I have decided to accept the invitation of the committee on rules and curriculum of the Baltimore board of school commissioners, to become the chairman of the proposed commission to "make a study of the curriculum and methods of instruction now obtaining in your schools, with a view of determining how they conform to the established standards in other large cities in this country."

In accordance with the suggestion conveyed in your letter and the informal conference I have had on the subject with yourself and Gen. Riggs, I have arranged with Prof. Ellwood P. Cubberley, of the Leland Stanford Junior University, to serve as a second member of this commission, and Prof. Cubberley and I have agreed to unite in nominating Mr. Calvin N. Kendall, superintendent of schools of the city of Indianapolis, as the third member. Supt. Kendall has signified his willingness to serve in this capacity.

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Trusting that these arrangements will prove satisfactory to your committee and to the board of school commissioners, and that the inquiry which this commission is to undertake may be of assistance to your honorable body, I am, believe me,

Very truly, yours,

ELMER ELLSWORTH BROWN,
Commissioner.

The commission met in the office of the Commissioner of Education in Washington at 11 a. m. March 7, 1911, all members being present. The chairman announced that Dr. Harlan Updegraff and Mr. Milo B. Hillegas, of the Bureau of Education, would assist him in the inquiry. The commission proceeded to organize, and elected Milo B. Hillegas as secretary.

Its personal examinations and inquiries in Baltimore were conducted for the most part in March. The time since April 1, except for occasional visits to Baltimore, has been occupied with the work indicated in the method of the study and in the preparation of this report.

LIMITS OF THE STUDY.

Any general inquiry into a city system of education would naturally concern itself with the following topics:

(1) The relation in general of the educational system to the economic and social conditions and needs of the community.

(2) The legal basis of the school system. The relation of the school department to other departments of the city government.

(3) Constitution, powers, and duties of the board of education and the committees of the board.

(4) The business management of the school system (including divisions of finance, sites and buildings, supplies, etc.; also system of accounting and records).

(5) Scope, organization, etc., of the school system.

(6) The school plant: Sites, buildings, and equipment.

(7) External relations of pupils to the schools (including the administration of child-labor and school-attendance laws, attendance upon other than public schools, transportation, etc.).

(8) Provision for safeguarding the health of school children (medical inspection, the employment of school physicians and school nurses, open-air schools, fire drill, playgrounds, play, physical exercises, etc.).

(9) The control and discipline of pupils.

(10) The system of training and instruction in the ordinary day schools, embracing the following chief divisions:

(A) The system of supervision; organization of schools and other units of supervision and teaching.

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(B) The teaching force (preliminary training, appointment, salaries, promotions, personal quality, control and influence in classes, individual and organized relations with the school system and with the community, scholastic and professional improvement while in service).

(C) The curriculum or course of study in day schools, elementary and secondary (with particular reference to such questions as the choice of studies, the addition of new subjects, the distribution of the hours of instruction in the several grades, the proportion and sequence of the several topics, etc.).

(D) Methods of training and instruction.

(E) Apparatus and materials for the purposes of training and instruction (textbooks, laboratories, workshops, libraries, schoolroom decoration, etc.).

(F) Tests of the attainments of pupils, promotion, graduation, the proportion of retarded members in the several classes, the moral quality of pupils and graduates, their health, intelligence, and efficiency.

(G) Auxiliary agencies and arrangements for increasing the effectiveness of the ordinary course of instruction and training (including provision for varying the rate of promotion, schools and classes for exceptional pupils, parental schools, etc.).

(11) Educational extension (including evening schools, continuation schools, public lectures, and other subjects embraced under the familiar title "Wider uses of the school plant").

Of the topics mentioned, the one which has been assigned to this commission is that numbered (10). In this report passing mention is made of other subjects as bearing on this central theme. The legal basis of the system and its financial support have been treated with some fullness, because of their intimate connection with the problem of the making of an adequate system of education. Of the subdivisions of topic (10), it has not been possible that all should be treated with equal fullness, because of limitations of time. It having been the desire of the board of school commissioners and also of this commission that the inquiry be completed by the 1st of April, or as soon thereafter as possible, the commission has found it necessary to center their chief attention upon the following:

(A) The system of supervision,

(B) The training and efficiency of the teaching force,

(C) The school curriculum, and methods of instruction,

devoting such additional attention as has been possible to other divisions of the tenth general topic, as enumerated above.

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THE METHOD OF THE STUDY.

The method pursued by the commission in making this study has for the most part been as follows:

(1) The history of the public-school system has been reviewed. For that purpose we have made use of official reports and other published materials. These have been supplemented by personal interviews with citizens of Baltimore, both within and outside of the school system, who have had direct knowledge of different stages of that history.

(2) A study has been made of recent and current criticisms of the system. We have gone over all published and written material of this kind which has come to our notice, both favorable and unfavorable. As is usual in such a case, the unfavorable criticism has been the more outspoken and voluminous. We have considered attentively this adverse comment, as presented from the most widely different points of view.

In order that there might be a full and free expression of present opinion on the subject, we addressed to the chairman of the committee on rules of the board of school commissioners a letter, in which we stated that the commission would welcome well-considered opinions, specific information, and suggestions as to ways in which the inquiry might be made most fruitful. The letter was made an official circular issued from the superintendent's office and was also given to the public press. In response to this announcement we received 50 communications, some of which had numerous signatures; 29 of the number were anonymous.

All of these communications, which for the most part were carefully and seriously written, have been attentively read and considered. Further than this, we have conferred personally with many citizens, representing different shades of opinion; with all of the members of the board of superintendents; with the faculties of the training schools; with all of the group principals of schools, with many of the vice principals, and with more than 300 of the teachers. At their request, we have given hearings, with all members of the commission present, to groups of representative teachers.

(3) We have given particular attention to observation of the actual work of the schools. This has involved personal visits by the members of the commission and their assistants to schools in every one of the 22 groups in the city. Of the 105 schools in Baltimore, we have visited in this way one-half, and in so doing have been in about 250 classrooms. Some of these visits were brief, and others of longer duration. Inasmuch as we were not passing judgment on individual teachers but on the system as a whole, it was more to our purpose to gain a general view by visiting many rooms in all sections of the

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city than to attempt a more detailed examination of a smaller number of classes. The fact that all of the members of the commission, and their assistants as well, had had practical experience in the inspection of schools, was an added reason why this procedure might be expected to yield fairly accurate information.

(4) Our first reliance for the interpretation of the materials so collected has been a comparison with other cities. With this end in view, visits have been made to half a dozen other cities; the published reports, regulations, and courses of study of a larger number of cities have been carefully examined by members of the staff of the Bureau of Education at Washington; and special inquiries have been sent to such cities, from the bureau, for the clearing up of certain points. For these comparisons, reference has been had ordinarily to the 13 largest cities in the country, according to the census of 1910, each having a population of over 350,000. Baltimore is the seventh city in population, and accordingly stands at the middle point of this list of 13. For certain particulars in which they are conspicuous, reference has been made to several other cities of less population than those in this list. Comparisons relative to financial affairs have been based on a special inquiry made by agents of the Bureau of the Census in the year 1909, covering a part but not all of the cities of 300,000 population and over. By a mere coincidence, the number of cities included in this list of the Census Office is also 13.

In making comparison with other cities, we have found it important to consider not only present conditions and practices but also the directions in which change has been made within the past generation, and particularly since the beginning of the twentieth century.

(5) Judgments, however, have not been based solely upon current practices and tendencies in our larger cities. The commission has deemed it proper and necessary that it should discriminate between the better and the less good in these tendencies and practices, and should express opinions based upon general conceptions of educational excellence. We realize the danger that such judgments may easily come to represent mere personal bias, and for this reason have recommended, in the main, only those practices which have been proved by experience. Where larger liberty has been taken in setting forth general principles and ideals of education, it has been done on the basis of substantial unanimity on the part of the several members of the commission and their assistants.

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CHAPTER II.

PRELIMINARY TOPICS.

THE RECENT HISTORY OF CITY SCHOOL SYSTEMS.

City school systems as organized at present in the United States had their beginnings about the time of the educational revival in the second quarter of the nineteenth century, when the simplicity of the older district units began to give place to the complexity of city organization. By the time of the Civil War the more highly developed form of educational organization was generally found in the larger American municipalities.

The history of city schools during the latter part of the nineteenth century may be briefly outlined by calling attention to some of the problems which arose into prominence at different times. After the problem of organization came that of the adjustment of the schools to the school population. Soon after the war the cities began an extraordinary growth—a growth, moreover, which was made by the addition of heterogeneous elements to the population. The enactment of compulsory school attendance laws followed.

Massachusetts had passed its attendance law as early as 1852, but it was not until the early seventies that the wave of such legislation swept over the country. In that decade nearly half of the States which now have compulsory school attendance passed such enactments. Out of these conditions arose questions touching the grading of schools, the promotion of pupils, school discipline, and kindred topics. In the eighties the problem became more generally one of instruction and the enrichment of the course of study. It was in the early eighties that manual training fairly made its appearance in American schools. Introduced at first into the high schools, it spread over the country and began to push its way down into the elementary grades. In the eighties and nineties the beginnings were made in the wider differentiation of school studies. In the nineties, particularly, more attention began to be given to such subjects as music, drawing, and physical culture. This broadening of school instruction made necessary a greater complexity of organization, the development of special functions in administration, supervision, and teaching, and increased attention to the training of teachers. The "Quincy methods," the Forum articles on city school systems, the report of the Chicago Educational Commission, and the organization

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of the Greater New York system of schools, are among the landmarks of this period.

During the first decade of the twentieth century the population of the United States increased about 21 per cent. In general, the cities have shown a greater growth than that of the country as a whole, and on the material side at least their school systems have kept pace with the growth in population.

On the side of school administration certain tendencies have been apparent during the decade, among which the following may be mentioned: The movement to reduce the number of members of school boards, the increasing demand for the removal of the schools from the influence of partisan politics, and the employment of specialists in different departments of the business management and the scholastic supervision of the educational system. As regards the teaching force, it may be said that the trend has been in the direction of higher salaries and the requirement of superior qualifications and greater efficiency. Closer supervision, a more flexible course of study for high schools, provision of special classes for exceptional children, more varied and more specialized teaching in the upper elementary grades, a closer adaptation of the ordinary school work to the ordinary needs of life, and provision in continuation schools for children who are compelled to go to work early in life, are some features of educational endeavor that have been uppermost of late in the minds of our educational authorities.

The decade has been marked by the extension of the school system to include various special activities, such as those of social and recreation centers, playgrounds, school gardens, baths, school lunch rooms, and savings banks operated by pupils in school, all of which seem destined to render the school more widely serviceable to the people.

Within the decade some movements of still larger significance have made notable headway. Perhaps the most important of these has appeared in the demand for vocational training. Within the past decade the emphasis in manual training has shifted from the cultural to the vocational aim, and now many school systems offer training which looks directly to a vocation in the industries. In addition to this industrial training, commercial courses and courses in domestic economy for girls have grown in popularity and are now widely offered in public schools.

Speaking in the most general terms, it may be said that a widening of the range of school activities, greater variation within that wider range, a closer touch with the actuality of industrial and civic interests, more expert and professional direction, with greater insistence on the moral aims that arise along with tendencies such as these, have been characteristic of these earlier years of the twentieth century.

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HISTORY OF THE BALTIMORE SYSTEM AND GENERAL STATISTICS OF THE CITY OF BALTIMORE.

CHRONOLOGICAL TABLE.

1826. State legislature passed laws permitting the mayor and council to establish, regulate, and support public schools; it was also provided that if the city did not avail itself of this privilege the State laws regarding public schools should apply. (Laws, 1825, 2d sess., chaps. 130, 162.)

1827. The mayor and council accepted the responsibility for the conduct of the public schools in Baltimore under these acts, which remained the fundamental State laws until 1868. (Ordinance of Jan. 17, 1827.)

1828. Board of school commissioners appointed by two branches of council. Composed of mayor, ex officio, and one member from each of six districts. Tenure, one year. Directed by council to establish a school of two departments (male and female) on monitorial plan; make rules and regulations; examine and appoint teachers and fix their compensation; report annually to city council including account of expenditures and estimates of expenses for ensuing year. The board was also authorized to appoint a superintendent of schools and to fix his compensation. (No superintendent appointed until 1866.) His duties were defined as follows: To inspect each school weekly and make monthly reports to commissioners regarding the number attending, tuition fees collected, discipline, and such other objects as may be required. (This ordinance vested the commissioners with full power to establish schools, but failed to provide adequate means for their organization and support.) (Ordinance of Mar. 8, 1828, No. 19, p. 17.)

1829. Public school fund placed in the hands of board of school commissioners. They were also authorized to receive bequests, donations, and grants. (Ordinance, Apr. 6, 1829.)

———. First school opened.

1830. Revision of ordinances—mayor no longer member of board. Mayor required to call body together within ten days after the election. President and secretary elected from members of board. Board authorized to establish other schools; required to furnish books and stationery for pupils, who were to pay in advance a sum not exceeding $1 per quarter each; authorized to lease buildings, procure lots, and erect buildings in name of the mayor and city council. (Ordinances of Apr. 7, 1830, No. 42, p. 138, and No. 29, p. 199.)

——— First public schoolhouse erected, on Aisquith Street near Fayette.

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1834. Board of school commissioners increased to 9 members. (Ordinance, May 12, 1834, No. 33, p. 41.)

1838. Revision—board increased to 13 commissioners. (Ordinance of May 22, 1838, No. 44, p. 110.)

1839. Male Central High School opened October 20. (Name changed to Baltimore City College, 1866.) Monitorial institutions entirely dispensed with.

1842. Board of school commissioners increased to 14 members, one from each ward. (Ordinance of Jan. 26, 1842, No. 1, p. 18.)

1844. Two female high schools established; one in the eastern and the other in the western part of the town.

1846. Board of school commissioners increased to 20 members, one from each ward. (Ordinance of Jan. 23, 1846, No. 1, p. 5.)

1848. Treasurer given duties of a superintendent. Treasurer reports 427 visits in 1861.

1851. Two normal classes organized; discontinued 1858.

1857. "Floating school" opened (nautical school maintained jointly with board of trade). (No. 38, p. 60.)

1866. Revision.—Secretary given charge of rooms, books, papers, and documents of board and required to perform such clerical duties as directed by the board or any of its committees. His salary must be approved by two branches of city council.

———. The appointment of a superintendent of public instruction was authorized. He must have been a resident of the city, possess literary and scientific acquirements, and skill and experience in the art of teaching. His term of office was to be four years. He was to devote his entire time to general supervision, "subject to such rules and regulations as the board of school commissioners may establish." He was also required, in conjunction with a committee of three commissioners, to examine applicants for teaching positions "in the forms prescribed by the board." His salary was to be fixed by the school commissioners subject to the approval of the two branches of the council.

The city register was directed to take charge of all school moneys and to pay out the same on bills examined by committee of accounts of the board and countersigned by the secretary of the board. (Ordinance of June 20, 1866, No. 74, Code 1869, p. 658.)

———. J. N. M'Jilton superintendent of public schools till 1868.

1867. Ordinance adopted directing board of school commissioners to establish separate schools for the colored children, under the same rules as governed the white public schools. (Colored children had previously been instructed in private schools or in the free schools which had been organized by the Association for the Improvement of Colored People, and which had been supported by private contribu-

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tions.) The board organized such schools but the city council failed to make an appropriation for their support.

1868. Separate schools for colored children authorized, to be supported from taxes paid for school purposes by colored people. (Ordinance of May 5, 1868, No. 68, p. 36.)

———. Statute. The relative powers of the mayor and council and of the board of school commissioners fixed by law. The full power and authority to establish schools was placed in the mayor and city council, who "may delegate supervisory powers and control to a board of school commissioners; may prescribe rules for building schoolhouses and for locating, establishing, and closing schools." "The board of school commissioners of Baltimore City, or by whatsoever name the body may be known that has supervisory powers and control over the public schools of Baltimore City, shall have power to examine, appoint, and remove teachers, prescribe the qualifications, fix the salaries, and select the textbooks for the schools of said city." (Laws of 1868, chap. 407.)

———. William R. Creery superintendent of public schools till 1875.

1872. Appointment of assistant superintendent ordered. He must be a resident of Baltimore. Same term of office as superintendent. To visit primary schools; to assist in the examination of teachers; to report to superintendent. (Ordinance of Apr. 22, 1872, No. 50.)

———. Normal class for instruction in "theory and practice of teaching" organized. Discontinued 1881.

1874. An English-German school established as an experiment.

1875. Free library established for the use of teachers and pupils of public schools.

———. Henry E. Shepherd superintendent of public schools till 1881.

1877. Commission of five citizens appointed by mayor and city council to inquire into public-school systems. (The Latrobe commission, reported in 1880.)

1881. Henry A. Wise superintendent of public schools till 1900.

1884. Manual training school organized.

———. Payment of $1 per quarter by each pupil as tuition or incidental fee abolished. (Ordinance of Oct. 6, 1884, No. 141.)

1886. Term of school commissioners changed from one year to four years. Members of board may be expelled by joint vote of two branches of council.

———. Appointment of superintendent of supplies authorized "to supervise, take care of, and have general control of all furniture, stoves, furnaces, fuel, repairs, and other incidental supplies," and such other duties as board may direct. (Apr. 8, 1886, No. 31, from Revised Code, 1892, p. 876.)

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1888. Mayor again became a member ex officio of the board of school commissioners, which body was increased to 22 members by reason of two additional wards formed from the "annex." Members of board elected to fill a vacancy by the board might hold office only until the next session of the council. (Mar. 2, 1888, No. 56, from Revised Code, 1892, p. 876.)

1890. "The schedule of salaries of all officers, employees, and teachers shall stand as now fixed." (Ordinance of June 12, 1890, No. 135, p. 195.)

1891. Board required to advertise for all purchases of $50 and over; proposals to be opened in presence of city comptroller, city register, and a committee of the board, who, together, should constitute a committee on awards. The comptroller, register, and committee were each to have one vote. (Ordinance, Apr. 1, 1891, No. 18.)

1892. Eight evening schools opened, under charge of 38 teachers, with 1,413 pupils enrolled. Cooking school opened.

1898. Present city charter passed. (Mar. 24, 1898, chap. 123.)

1900. James H. Van Sickle superintendent of public schools to date.

1901. Group system of supervision introduced.

———. Training school for teachers established.

1902. Manual training centers established.

———. Preparatory classes introduced.

GENERAL STATISTICS OF BALTIMORE FOR 1900–1910.

Population, etc., 1900.

Total population, 1900	508,957
White	429,218
Colored (15.6 per cent)	79,258
Other races	481
Total public school enrollment, 1900	79,659
Average attendance	54,403

Occupations of inhabitants 10 years of age or over, 1900.[1]

	Males.	Females.	Totals.
Agricultural pursuits	1,303	127	1,430
Professional service	7,197	3,092	10,289
Domestic and personal service	36,091	28,417	64,508
Trade and transportation	54,143	7,666	61,809
Manufacturing and mechanical pursuits	57,715	21,599	79,314
Totals	156,449	60,901	217,350

[1] Twelfth Census of the United States, 1900: Special Reports, Occupations, pp. 488–494.

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Number engaged in the principal occupations, 1900.

	Males.	Females.
Trade and transportation:		
Clerks and copyists	11,622	.....
Merchants and dealers (excluding wholesale)	8,018	1,197
Draymen, hackmen, teamsters, etc.	6,988	.....
Salesmen	4,937	3,042
Steam railroad employees	3,488	.....
Agents	2,646	.....
Bookkeepers and accountants	2,463	.....
Manufacturing and mechanical pursuits:		
Tailors	6,157	2,220
Carpenters and joiners	4,280	.....
Painters, glaziers, and varnishers	3,088	.....
Machinists	2,957	.....
Tin-plate and tinware makers	2,561	.....
Manufacturers and officials, etc.	2,411	.....
Boot and shoe makers and repairers	2,089	.....
Seamstresses	.....	5,593
Dressmakers	.....	4,912
Shirt, collar, and cuff makers	.....	1,967
Cotton-mill operatives	.....	1,470
Milliners	.....	1,095

Statistics of manufacturing.

Number of manufacturing establishments, 1905 [1]	2,163
Capital	$148,763,503
Wage earners	65,224
Wages	$25,633,550
Cost of material used	$81,014,029
Value of products, including custom work and repairing	$151,546,580

Assessed valuation and rate of taxation.

Assessed valuation of property subject to general property tax (1908)[2]	$433,343,182
Rate per $1,000 valuation, 1908	20
Assessed valuation of property subject to special property tax (1908)	226,688,857
Rate per $1,000 valuation, 1908—securities	3

Population, etc., 1910.

Total population, 1910 [3]	558,485
White	473,388
Colored (15.2 per cent)	84,749
Other races	348
Total public school enrollment	79,838
Average attendance	55,103

THE LEGAL BASIS OF THE SYSTEM.

The history of school administration in Baltimore may be divided into two periods: (1) From 1826 to 1900; (2) from 1900 to the present time. The first period is characterized by the predominance of the mayor and city council; the second by the limited ascendancy of the board of school commissioners and the board of superintend-

[1] Special reports of the Bureau of the Census: Manufactures, Pt. II, 1905, p. 403.
[2] Special reports of the Bureau of the Census, Statistics of Cities, 1908, p. 56.
[3] Statement of Director of the Census, May 15, 1911.

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ents. From a point of view of practical administration these periods may be described as the political and nonpolitical, respectively.

The first period.—Under the act of January 17, 1826, the city council exercised full authority in the management of schools, subject to such special laws as were passed by the legislature. These were, however, few in number and did not change appreciably the practice that had grown up under city ordinances.

The functions of the board of school commissioners just previous to 1900 were confined to the examination of applicants for teaching positions, the appointment of teachers and other employees, and the fixing of their salaries, the selection of textbooks, the prescription of the course of study, the purchase of equipment and supplies, the contracting for repairs, the framing of the rules and regulations, and the making of annual reports and annual estimates to the mayor and the council. In the performance of these functions they were limited by the mayor and the council in the following ways:

(1) Under its authority to approve salaries, the council actually fixed the salaries of all officers and teachers.

(2) In all purchases and contracts of over $50 a committee of the board had one vote in three (the city comptroller and the city register had one each) in making the awards after proper advertising.

(3) No goods or services could be bought from members of the board.

(4) Expenditures must have been for no other purposes than those stated in estimates, and must have been kept in as exact proportion as possible to the amounts as given.

(5) Powers and duties of superintendent, assistant superintendent, secretary, and superintendent of supplies were fixed by the council.

At the same time the mayor and the council exercised the power of revision of estimates, of taxation, of purchasing sites and erecting schoolhouses, of delegating "supervisory powers and control" to a subordinate board whose members were chosen by them, and of defining its authority in any way except in the matters of examination and appointment of teachers and selection of textbooks.

The mayors and the councilmen of Baltimore from 1840 to 1899 were presumably no better and no worse than the men who held like positions in the other large cities of our country under similar charters. Such motives and rewards as have appealed to the incumbents of such positions in our cities doubtless influenced them in the performance of their duties. While, in theory, the board of school commissioners was selected by the council in joint assembly, in practice each first branch councilman selected the school commissioner from his own ward, his nomination being equivalent to an election by virtue

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of so-called "senatorial courtesy." There were 22 wards. The mayor was also a member of the board ex officio. The school commissionership was very frequently used as a stepping stone to the council or else was given to the outgoing councilman by the man who had defeated him.

In the conduct of the business of the board political considerations were of the greatest importance. The president of the board was always of the political party having the majority of the membership. In making his committee appointments the members of his own party received the chairmanships, which carried predominant influence, and a majority of the places on the general committees, of which there were 30 in 1898. However, each member was chairman of the local committee for the schools of his own ward, and through courtesy was given by the one other member of the committee full freedom as regards those schools. Those administrative functions which were directly or remotely connected with the building up of political influence were guarded closely by the school commissioners and kept for the most part in their own hands.

The superintendent was relegated to the rear. He was a "fifth wheel." The ordinance provided that he must be a man "of literary and scientific acquirements and of skill and experience in the art of teaching," but his duties were limited to visitation, suggestion, and reporting. He had little real authority in the conduct of schools. Teachers and principals looked to the local committeemen, and in some cases to the chairman of a general committee, for their positions, increase in salaries, and additional supplies and textbooks. That which the superintendent accomplished was largely by "moral suasion." He was also by ordinance a member of the examining committee, together with three commissioners and later with the assistant superintendent. But the ordinance provided that the examinations should be conducted "in the forms prescribed by the board," and the superintendent was powerless in preventing the passing of incompetent and poorly prepared applicants when any such persons acquired or possessed the support of a commissioner who could secure the support of a majority of the committee or of the board.

The second period.—The charter of 1898 created a department of education upon practically the same footing in regard to freedom of authority as other departments. In consequence, the board of school commissioners is still limited in the exercise of its authority to an unusual degree as compared with the authority usually exercised by school boards. The following statement relating to the different officers and boards which participate in the general control of schools, together with the principal powers and duties of each, presents an outline of the present system of school administration:

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(1) The mayor, who appoints the board of school commissioners, serves upon various boards described below, and approves the ordinances of estimates.

(2) The second branch of the city council, which confirms the appointments to the board of school commissioners made by the mayor.

(3) The first and second branches of the city council, which pass the ordinances of estimates. They may reduce but they can not increase the amount of any item in the ordinance; neither may they introduce any new item.

(4) The board of estimates, composed of the mayor, the city solicitor, comptroller, president of the second branch of the city council, and president of the board of public improvements, which prepares the ordinances of estimates.

(5) The inspector of buildings, who has charge of the construction and repair of all school buildings and of their fixed equipment. The responsibility is also placed upon him for securing action by the various commissions and boards mentioned in the succeeding section.

(6a) The commission for the selection of sites, composed of the mayor, comptroller, and president of the board of school commissioners as head of the department of education.

(6b) The architectural commission, composed of three members appointed by the mayor with the approval of three members of the art commission. This commission selects the designs and the architect for each school building; but the board of school commissioners must approve the plans before the construction of the building is begun.

(6c) The board of awards, composed of the mayor, comptroller, city registrar, city solicitor, and the president of the second branch of the city council, which opens the bids submitted for the erection of buildings and awards the contracts. The mayor signs all such contracts.

(7) The board of school commissioners, composed of nine members serving for six years without pay, three being appointed every even numbered year for terms beginning March 1. A school commissioner may be removed by the mayor at his pleasure at any time within six months after his appointment; after that date he may be removed only for cause after charges have been preferred and trial had before the mayor. The president of the board is designated by the mayor at the time of his appointment.

The powers and duties of the board of school commissioners are not clearly defined. In general they lie in the field between those given the other departments and those given the subordinates of the board—the board of superintendents, superintendent of public

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instruction, supervisor of buildings, and secretary. The board is constituted the "head" of the department of education. It is empowered to confirm or reject all nominations of teachers, to appoint and remove at its pleasure all officers, secretaries, clerks, and employees; to appoint secondary teachers; to fix the salaries of all appointees; to remove teachers after charges preferred by superintendent and trial had; to instruct the building inspector regarding plans for proposed schoolhouses, and to purchase textbooks and stationery. In fact, the board has exercised full authority within the field not definitely assigned to other agencies. It has directed the general policy of the schools upon the advice of its professional experts and has issued rules and regulations to govern the operations of the school plant and the conduct of instruction.

(8) The board of superintendents is composed of a superintendent of public instruction and one or more assistant superintendents elected by the board of school commissioners for indefinite terms. The duty of this board that is made most prominent in the charter is that of "the examination of teachers and their nomination to the board of school commissioners for appointment or promotion." The charter emphasizes the board of superintendents as opposed to the superintendent, requiring that the board hold regular meetings and keep a record of the same, and even going so far as to provide that in case of disagreement its members may present majority and minority reports to the board of school commissioners. The ordinary duties of such officers—supervision and inspection, reports, advising the board respecting courses of study, textbooks, and methods of instruction—are also provided for. The rules of the board strengthen the position of the superintendent. He is named the chief executive officer of the board and is authorized to assign and transfer all teachers, to define their duties, to call meetings whenever he deems them necessary, and to regulate by orders, written or otherwise, the operation of the school system in any manner not inconsistent with the rules.

(9) The charter provides that the supervisor of school buildings shall aid the superintendent of public instruction in ascertaining the sanitary condition of every school and in reporting to the proper authorities what repairs or improvements are necessary, and in addition to having general supervision of school buildings in respect to heating, plumbing, and ventilation he shall perform such other duties as the board may direct. The board has given him the authority to nominate engineers, firemen, janitors, and janitresses (there are great numbers of the latter, at least one to every floor in each school house), and to remove them without reference to the board. He

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also passes upon requisitions for repairs and equipment made by principals, but his responsibility connected with purchases is confined entirely to fuel. He is elected by the school commissioners for an indefinite term.

(10) The secretary of the board of school commissioners is named in the city charter, but none of his duties are defined in that document. Under the rules of the board he performs the functions of clerk in the recording of the proceedings of the board and in attending to that part of the correspondence that has to do with business affairs. All records of the action of the board are in his charge. He examines vouchers and keeps a memorandum account of bills approved by the board. Requisitions for supplies from the offices of the superintendent of public instruction and the supervisor of school buildings are either purchased directly by him or through the municipal authorities. He is also the custodian of supplies after their purchase. He also is elected by the board of school commissioners for an indefinite term.

FINANCIAL SUPPORT OF THE SYSTEM.

This portion of the report is divided into three parts: (1) Total school expenses; (2) total receipts from general revenues for municipal purposes; (3) school expenses in detail.

TOTAL SCHOOL EXPENSES.

The absolute figures upon which all percentages, average costs, and ratios are based are taken from schedules made out by agents of the Bureau of the Census after personal investigation of the records, or from the bulletin of that bureau upon statistics of cities, 1908. The percentages, average costs, and ratios are taken from a study of these figures, not yet published, which is in preparation in the Bureau of Education. In each of the three parts of the study, comparison is made between the expenses and receipts of 13 cities, including Baltimore, having in 1910 a population of 300,000 or over. The statistics of the various cities are in all cases for fiscal years ending between July 1, 1908, and June 30, 1909; those of Baltimore are for the year ending December 31, 1908. These are the latest satisfactory statistics that are available. New York and a few other of our larger cities are omitted because not reported by the Census Office in the year referred to.

As compared with the 12 other cities in this group Baltimore's expenses for schools in 1908 were less per capita of population than those of any other city except one—New Orleans. The average cost of Baltimore was $3.32, or 94 cents less than the median. If Baltimore had spent as much per capita of population as the median city

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during 1908 she would have increased her expenditures for public schools by almost $515,000. The following table and diagram illustrate the relative amounts per capita for each city in the group:

TABLE 1.—*Total expenses of schools per capita of population, 1908.*[1]

Chicago, Ill	$4.54	Milwaukee, Wis	$3.66
St. Louis, Mo	4.20	Newark, N. J	6.02
Cleveland, Ohio	4.53	New Orleans, La	2.89
Baltimore, Md	3.32	Washington, D. C	6.40
Detroit, Mich	4.00	Los Angeles, Cal	4.76
Buffalo, N. Y	3.96	Minneapolis, Minn	4.78
San Francisco, Cal	4.26		

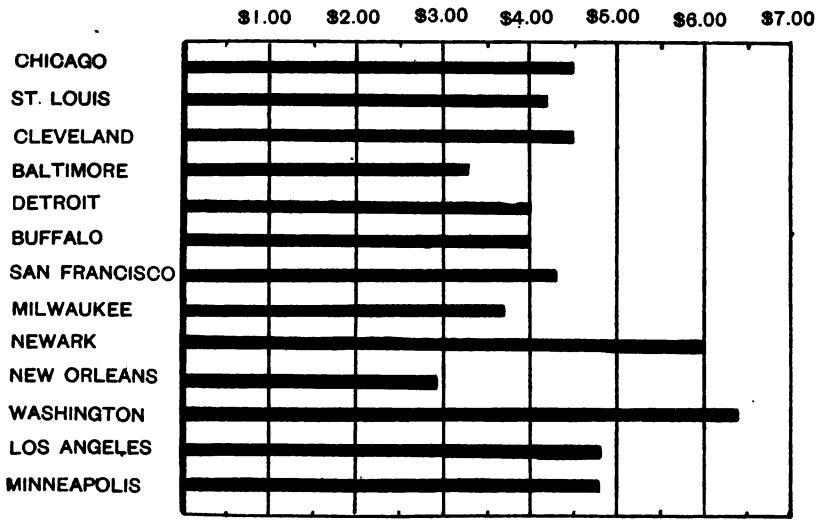

FIG. 1. Cost of schools per capita of population, based on Table 1.

A comparison of the relative amounts of school expenses and of total city expenses in these 13 cities shows that Baltimore expended for school purposes a larger percentage of the total city expenses than 4 cities and a smaller percentage than 8. The median or average percentage was 25.9; Baltimore's percentage was 24. In other words, in the average, or normal city, 25.9 cents out of every dollar expended for all municipal purposes went for schools, while in Baltimore only 24 cents were so expended. The following table and diagram present these facts:

[1] The revised estimates of population in June, 1908, as made by the Census Office have been used in making this and the following computations. This estimate is for Baltimore 549,017.

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TABLE 2.—*Ratio of total school expenses to total city expenses, 1908.*

Chicago, Ill	0.26	Milwaukee, Wis	0.25
St. Louis, Mo	.23	Newark, N. J	.32
Cleveland, Ohio	.32	New Orleans, La	.23
Baltimore, Md	.24	Washington, D. C	.26
Detroit, Mich	.28	Los Angeles, Cal	.35
Buffalo, N. Y	.24	Minneapolis, Minn	.37
San Francisco, Cal	.20		

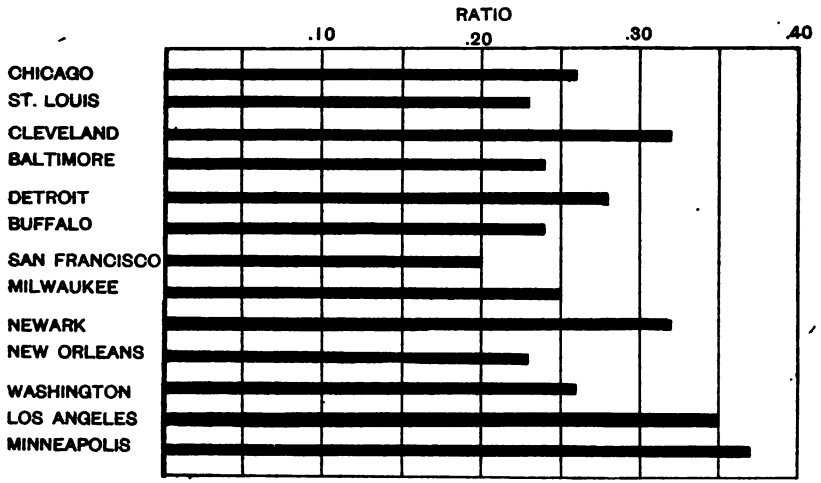

FIG. 2.—Ratio of school expenses to city expenses, based on Table 2. The various ratios, .10, .20, etc., may be read also as 10 per cent, 20 per cent, etc.; for example, the school expenses of San Francisco were 20 per cent of the city expenses.

A comparison of expenses for schools and for police in these 13 cities shows that 2 cities spent smaller relative amounts for schools than Baltimore, while 10 cities were relatively more liberal. For every dollar spent for police, Baltimore spent only $1.47 for schools, while the median or average city spent $2.12. The following table and diagram present the facts:

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TABLE 3.—*Ratio of total school expenses to expenses for police.*

Chicago, Ill	1.55	Milwaukee, Wis	2.42
St. Louis, Mo	1.41	Newark, N. J	2.56
Cleveland, Ohio	2.94	New Orleans, La	3.01
Baltimore, Md	1.47	Washington, D. C	1.86
Detroit, Mich	2.12	Los Angeles, Cal	2.93
Buffalo, N. Y	1.69	Minneapolis, Minn	4.24
San Francisco, Cal	1.22		

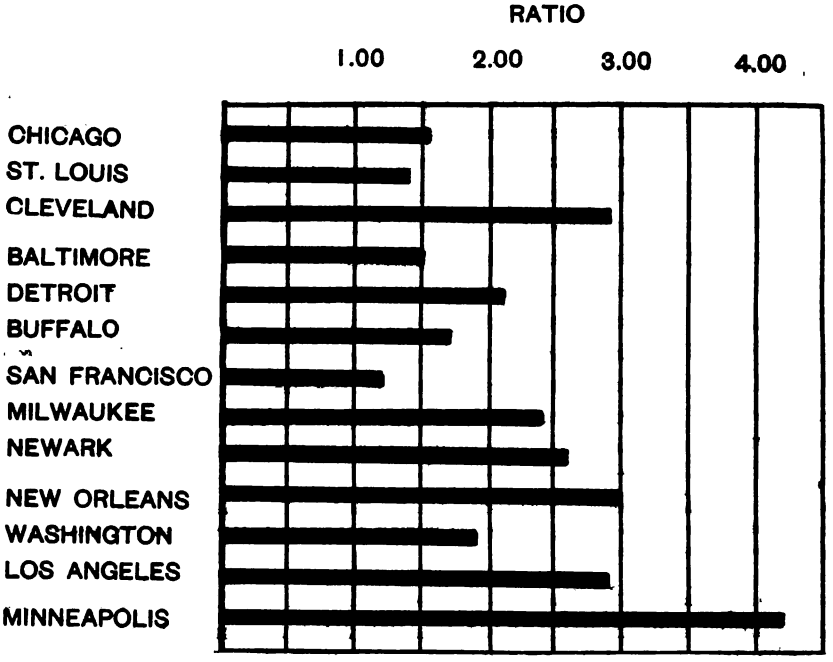

FIG. 3.—Ratio of school expenses to expenses for police, based on Table 3. The various ratios, 1, 2, etc., may be read also as 100 per cent, 200 per cent, etc.; for example, the school expenses of New Orleans were 301 per cent of the expenses for police.

The above facts would suggest that Baltimore did not expend so much per capita to maintain its municipal affairs in general as did the most of the cities. Upon inquiry it is found that Baltimore expended for current expenses a less amount per capita than 10 and a greater amount than 2 of the 13 cities. The median city of this group paid $16.02 per capita to carry on its municipal affairs while Baltimore paid but $13.29, a difference of $2.73. The following table and diagram represent the facts:[1]

[1] From Special Reports of the Bureau of the Census: Statistics of Cities, 1908, p. 296.

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TABLE 4.—*Per capita payments for general and special service expenses.*

Chicago, Ill	$16.34	Milwaukee, Wis	$15.57
St. Louis, Mo	17.53	Newark, N. J	20.28
Cleveland, Ohio	15.09	New Orleans, La	12.57
Baltimore, Md	13.29	Washington, D. C	24.52
Detroit, Mich	16.02	Los Angeles, Cal	13.52
Buffalo, N. Y	16.88	Minneapolis, Minn	12.41
San Francisco, Cal	23.68		

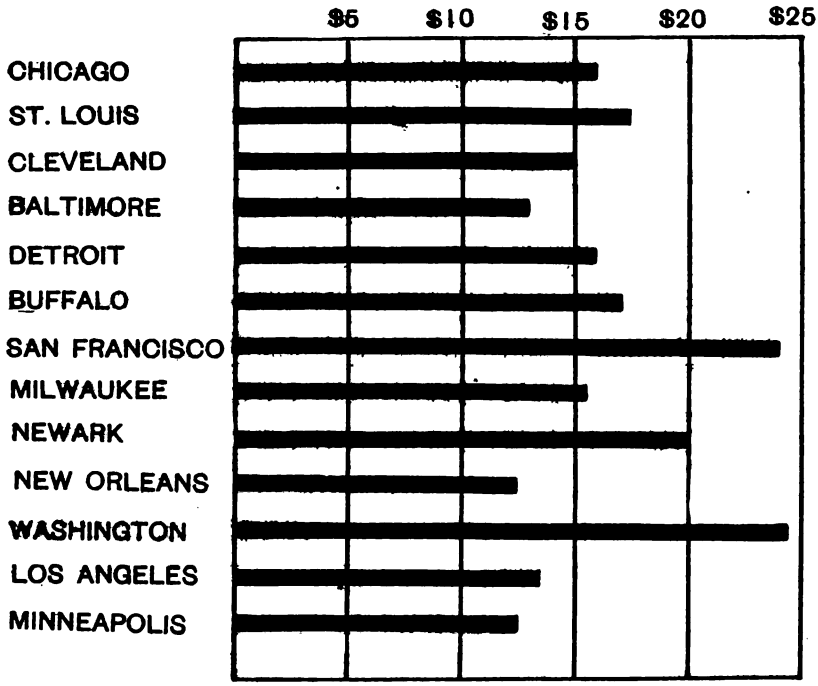

FIG. 4.—Amounts per capita of population expended for general and special service expenses; based on Table 4. These expenses include practically all current expenses.

Had Baltimore's expense per capita for all municipal purposes equaled $16.02, the median or average per capita for the group of cities, and had the department of education expended the median or average proportion of the total city expenses, about $390,000 would have been added to the support of the schools.

TOTAL RECEIPTS FROM GENERAL REVENUES.

Inasmuch as Baltimore did not expend for its schools or for its municipal affairs generally as much as the average or normal city, it is pertinent to inquire into the credit side of municipal finances. The results of a study of receipts from general revenues in cities of 300,000 population or over in the United States in 1908, which formed over 70 per cent of the receipts from all city revenues, shows

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that Baltimore's receipts were but $16.32 per capita of population, while those of the median or average city were $18.07. The same per capita for Baltimore during 1908 as that enjoyed by the median city would have added to its receipts over $960,000. The following table represents the facts in this matter and also shows the amounts per capita of population that each of the various cities obtains from each principal source of revenue:

TABLE 5.—*Total amounts and amounts per capita received from each of the principal sources of revenue in 1908.*

[The amounts are taken from special reports of the Bureau of the Census: Statistics of Cities, 1908, pp. 192–193; the population figures from p. 343.]

No.	Cities.	Estimated population.	All receipts.		Taxes.		Licenses and permits.	
			Total.	Per capita.	Total.	Per capita.	Total.	Per capita.
1	Chicago, Ill.	2,092,869	$41,546,465	$19.95	$31,843,470	$15.25	$8,608,914	$4.12
2	St. Louis, Mo.	665,802	13,799,932	20.71	11,773,339	17.67	1,495,724	2.25
3	Cleveland, Ohio.	523,187	9,345,285	17.88	7,628,341	14.59	1,329,358	2.54
4	Baltimore, Md.	549,079	8,963,040	16.32	7,518,725	13.69	902,959	1.65
5	Detroit, Mich.	426,592	7,037,586	16.49	5,457,955	12.79	867,432	2.03
6	Buffalo, N. Y.	405,714	7,499,983	18.49	6,556,446	16.18	709,633	1.75
7	San Francisco, Cal.	402,836	9,385,013	23.35	7,073,395	17.55	1,582,537	3.93
8	Milwaukee, Wis.	350,852	6,142,214	17.50	4,859,602	13.87	869,525	2.48
9	Newark, N. J.	322,784	5,826,020	18.07	3,732,374	11.57	615,199	1.91
10	New Orleans, La.	329,207	5,848,151	17.79	4,771,561	14.50	734,212	2.23
11	Washington, D. C.	321,128	12,168,378	37.93	5,169,374	16.12	644,750	2.01
12	Los Angeles, Cal.	270,491	5,273,272	19.53	3,446,268	12.78	717,594	2.66
13	Minneapolis, Minn.	286,241	4,633,924	16.20	3,868,398	13.55	483,334	1.69

No.	Cities.	Estimated population.	Fines and forfeits.		Subventions and grants for education.		Other subventions and grants and gifts.	
			Total.	Per capita.	Total.	Per capita.	Total.	Per capita.
1	Chicago, Ill.	2,092,869	$548,790	$0.263	$340,585	$0.164	$204,706	$0.099
2	St. Louis, Mo.	665,802	107,020	.161	283,243	.425	140,585	.211
3	Cleveland, Ohio.	523,187	23,901	.457	251,565	.481	111,115	.213
4	Baltimore, Md.	549,079	9,569	.174	531,787	.969	.....	.....
5	Detroit, Mich.	426,592	12,334	.289	670,119	1.570	29,746	.069
6	Buffalo, N. Y.	405,714	35,020	.086	145,798	.359	53,086	.131
7	San Francisco, Cal.	402,836	33,718	.084	674,194	.167	19,683	.048
8	Milwaukee, Wis.	350,852	56,105	.160	263,393	.751	93,589	.238
9	Newark, N. J.	322,784	23,672	.073	1,360,293	.421	94,482	.293
10	New Orleans, La.	329,207	32,485	.098	185,257	.563	121,239	.369
11	Washington, D. C.	321,128	112,087	.349	2,697,137	8.403	3,543,064	1.103
12	Los Angeles, Cal.	270,491	66,147	.245	1,029,542	3.813	13,721	.051
13	Minneapolis, Minn.	286,241	57,616	.202	210,196	.735	14,380	.050

From the above table it will be seen that Baltimore, as compared with other cities, secured the smallest amount per capita from licenses and permits, was fifth in the amount per capita received from taxes, seventh in amount received from fines and forfeits, and tenth in amount per capita received from subventions and grants from other civil divisions for education, while nothing was received from subventions and grants for other purposes. Had Baltimore received as much per capita from licenses and permits as the median city, about $318,000 would have been added to its resources in 1908; and had as

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much been raised per capita from taxes as the median city, about $445,000 would have been added to its available funds for 1908. While it is true, on the other hand, that the subvention received from the State for educational purposes was paid by this city, and still more in addition, as the State school tax, the same may be said of other cities. In fact it seems almost universally true that cities pay more into the State treasuries than they receive back from them, and it is altogether probable that Baltimore fares no worse in this respect than most cities.

EXPENSES IN DETAIL.

The various items of expense of a city school system should be judged from two standpoints: First, as to the distribution of the total expenses among the various schools and activities and the various objects necessary to their operation; second, as to the unit costs of the various schools, activities, and objects for which expenses were incurred.

The following table shows (1) the median or average percentages of the total expenses that were expended in 1908–9 in 13 of the cities of the United States of 300,000 population and over for each of the principal divisions of school expenses; (2) the same for Baltimore for 1908; (3) the divisions in which there was an excess in Baltimore of expenses above the average percentage and the amounts thereof; and (4) the divisions in which there was a deficiency and the amounts thereof.

Principal divisions.	Median percentages of total expenses in all cities.	Median percentages of total expenses in Baltimore.	Excesses in Baltimore.	Deficiencies in Baltimore.
General control[1]	2.5	2.2	.....	0.3
Elementary schools	77.5	78.4	0.9	.....
Secondary schools	14.2	14.2	.....	.....
Normal, evening, vacation, and special schools	3.5	1.2	.....	2.3
Miscellaneous expenses	2.3	4.0	1.7	.....
Total	100.0	100.0	2.6	2.6

[1] Under general control are included expenses of board of education, of finance offices, of superintendent's office, and other overhead charges.

As measured solely by the standard of other cities combined, Baltimore gave too large a part of her limited funds to elementary schools and to miscellaneous expenses, too small a proportion to general control and to normal, evening, vacation, and special schools, and exactly the correct proportion to secondary schools. Only 3 cities of the 13 gave a larger proportion to elementary schools, and 9 gave less, while 1 other city gave a larger proportion to miscellaneous expenses. On the other hand only 4 cities gave less for general con-

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trol, and only 2 less for normal, evening, vacation, and special schools. Six cities gave less and 6 gave more toward the support of secondary schools.

Certain expenses involved in the maintenance and operation of these schools and activities deserve particular notice. The most uneconomical expense connected with the Baltimore system was that of rent. Two and six-tenths per cent of the total expenses went for this purpose, 1.4 per cent greater than in any other city and 2.3 per cent more than the median, or average, for the group of cities. The next greatest excess was for textbooks, stationery, and supplies: 1 per cent in the secondary schools and 0.8 per cent in the elementary schools. No other city spent so large a percentage for rent, although Minneapolis spent but one-tenth of 1 per cent less, while 3 cities spent more for elementary texts, etc., than did Baltimore. The next widest departure proportionately was for fuel in the elementary schools, but one city, Washington, spending a larger proportion for this purpose. The amount of the percentage in Baltimore was 3 per cent, in Washington 3.2 per cent.

As regards the proportion of the total expenses devoted to salaries of teachers in elementary schools, Baltimore gave more than 8 cities and less than 4. The entire list of cities, with the percentages of the total expenses, follows: Cleveland, Ohio, 46.8; Washington, D. C., 50.6; Buffalo, N. Y., 51.4; St. Louis, Mo., 53.7; New Orleans, La., 57.7; Newark, N. J., 57.8; Chicago, Ill., 58; Detroit, Mich., 58.4; Baltimore, Md., 58.5; Milwaukee, Wis., 58.6; Minneapolis, Minn., 60.3; San Francisco, Cal., 61; Los Angeles, Cal., 63.7.

While, after rent, textbooks, and fuel, the proportion of the total expenses paid to elementary teachers constituted the next greatest excess above the median, or average, percentage paid for this purpose by the group, it must not be forgotten that Baltimore had a low scale of expenses, and that for this reason the average cost per child for these purposes was low as compared with the other cities, as will be seen when comparisons of average costs are made. This fact also makes the deficiencies in percentages of total expenses all the greater from the standpoint of average cost than would appear from the average cost figures taken alone. It also follows that should the scale of expenses be raised, the percentage of expenses for fuel and textbooks would be lowered, for it would not be necessary to increase the actual expenses for these purposes, and as the percentages would be reckoned on the basis of higher total expenses caused by the greater expenses for other purposes, those for fuel and textbooks would be decreased.

There are three classes of expenses for which, relatively, the deficiencies appear almost equally large—supervision of elementary schools, salaries of janitors of elementary schools, and supplies for janitors of elementary schools—for each of which Baltimore spent a

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less percentage than any of the other cities. For the first she expended 0.2 per cent, or 0.7 per cent less than the median or average; for the second 3.5 per cent, or 1 per cent less than the average; and for the last 0.01 per cent, or 1.1 per cent less than the average.

Unit costs.—With less money to spend, a lower scale of expenses was the necessary result. The extended variations from the standard distribution of expenses was shown above. It would be expected that the items showing low percentages would have low average costs and that the items showing high percentages would have the highest average costs. But differences in enrollment and other factors affect the averages and this does not always follow. On the whole, however, the scale of expenses in Baltimore was so low as to cause low average costs even for items that have an excess in percentages of expenses.

This is true of total expenses of elementary schools and of salaries of teachers in elementary schools, in both of which Baltimore has the lowest average costs of all the cities. This is caused in part by the large enrollment in the elementary schools. The following tables and diagrams show the exact figures and relationships. To have brought up the expenses of elementary schools from $18.71 per pupil to the median amount for all of the 10 cities included—$26.54—would have required an additional expenditure for the year of about $600,000. Of this amount in order to have brought up the average salary of teachers from $13.95 to $20.36 per pupil about $500,000 per year would have been required.

TABLE 6.—*Per capita costs of total expenses of elementary schools, based on enrollment.*

Chicago, Ill	$26.77	San Francisco, Cal	$33.57
St. Louis, Mo	23.17	Newark, N. J	28.19
Baltimore, Md	18.71	Washington, D. C	31.32
Detroit, Mich	26.31	Los Angeles, Cal	25.40
Buffalo, N. Y	22.51	Minneapolis, Minn	27.11

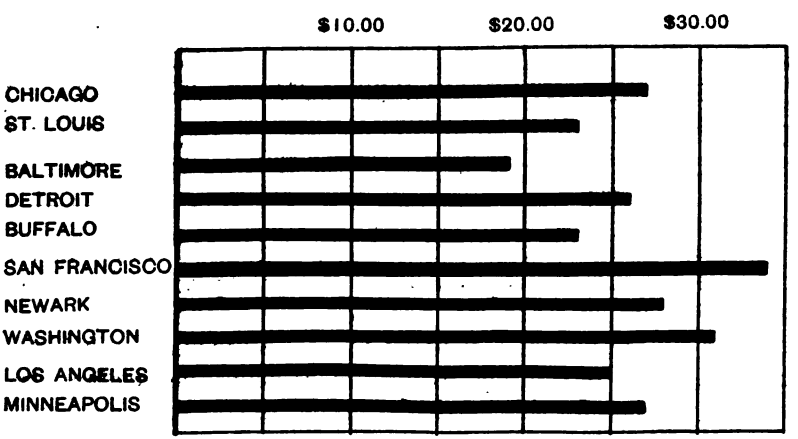

FIG. 5.—Per capita costs of total expenses of elementary schools, based on enrollment; based on Table 6.

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TABLE 7.—*Per capita costs of salaries of teachers in elementary schools, based on enrollment.*

Chicago, Ill	$20.06	San Francisco, Cal	$26.43
St. Louis, Mo	18.30	Newark, N. J	20.94
Baltimore, Md	13.95	Washington, D. C	21.24
Detroit, Mich	20.20	Los Angeles, Cal	21.48
Buffalo, N. Y	14.32	Minneapolis, Minn	20.52

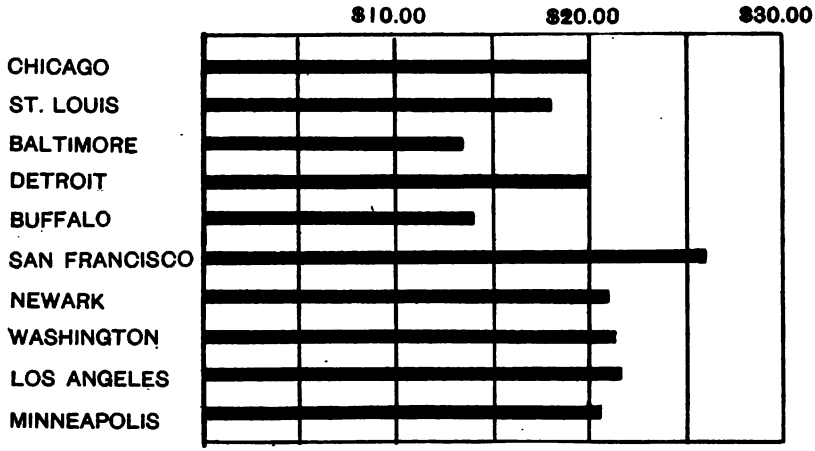

FIG. 6.—Per capita costs of salaries of teachers in elementary schools, based on enrollment; based on Table 7.

The following table brings together these facts and others relating to low average costs in elementary schools. While the computations are in the rough, they are sufficiently accurate for the purpose. The enrollment of the elementary schools in Baltimore is figured as 76,500 in each case.

Items.	Median average costs, all cities.	Baltimore's average costs.	Unit differences.	Total Baltimore deficiencies.
Total expenses	$26.54	$18.71	$7.83	$600,000
Salaries, teachers'	20.36	13.95	6.41	500,000
Supervision	.365	.04	.325	25,000
Janitors', engineers', etc., salaries	1.73	1.32	.41	34,000
Janitors' supplies and sundry expenses of maintenance and operation	.37	Trace.	.37	28,000
Libraries	.05	.00	.05	4,000
Apparatus and manual training equipment	.09	.03	.06	4,500
Repairs and replacement of equipment	.20	.14	.06	4,500

The above table indicates that at least $25,000 more should be expended annually for supervision of elementary schools in order to place Baltimore on a par with other cities. As the average cost per pupil for supervision of secondary schools compares favorably with the average cost of other cities, Baltimore being the median city, no increased expense for this particular branch of supervision is required.

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It should be remembered, however, that the percentage of the total expenses which was expended in Baltimore for the superintendents' office was below the average.

Expansion in the board of superintendents' office is demanded if Baltimore is to meet the standard set by other cities. Our statistics do not permit us to fix the exact amount of increase; but it should be at least $10,000, and most probably $20,000, per year. This amount added to the $25,000 for elementary schools makes a total of from $35,000 to $45,000 required for increased supervision of all classes of schools in order that Baltimore's practice may be in agreement with that of other cities of her class.

While the percentage of expenses devoted to secondary schools was the median amount, the average cost of these schools in Baltimore was above the median, due to the comparatively small enrollment in the high schools. The median average cost per pupil for the group was $64.39, and for Baltimore $72.82, a difference of $8.43 per pupil, or an excess of about $31,000. While this shows that the secondary schools were more adequately supported for each pupil enrolled than any other part of the system, nevertheless it was no more than was properly due this type of schools.

On the other side of the account is an item that must not be lost sight of—rent. A large portion of the amount expended for this purpose—$47,089—would have been spent by other cities for other objects.

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SCOPE AND ORGANIZATION OF THE SYSTEM OF EDUCATION.

SCOPE OF SYSTEM.

(See diagram opposite.)

The following statistics show the scope of the system. All of the various parts are well adjusted to each other, except the kindergarten which is not an integral part of the system:

Groups:		
White	19	
Colored	3	
		22
Elementary buildings		105
Classrooms (approximate)		1,500
Preparatory class centers		4
Preparatory classes		23
Secondary schools:		
White (female)	2	
White (male)	2	
Colored (male and female)	1	
		5
Training schools:		
White	1	
Colored	1	
		2
Cooking centers		20
Manual training centers		17
Kindergarten classes		21
Ungraded classes		31
Special classes		5
Evening schools:		
Secondary—		
White	2	
Colored	1	
		3
Elementary—		
White	9	
Colored	5	
		14
Cooking centers (white)		10

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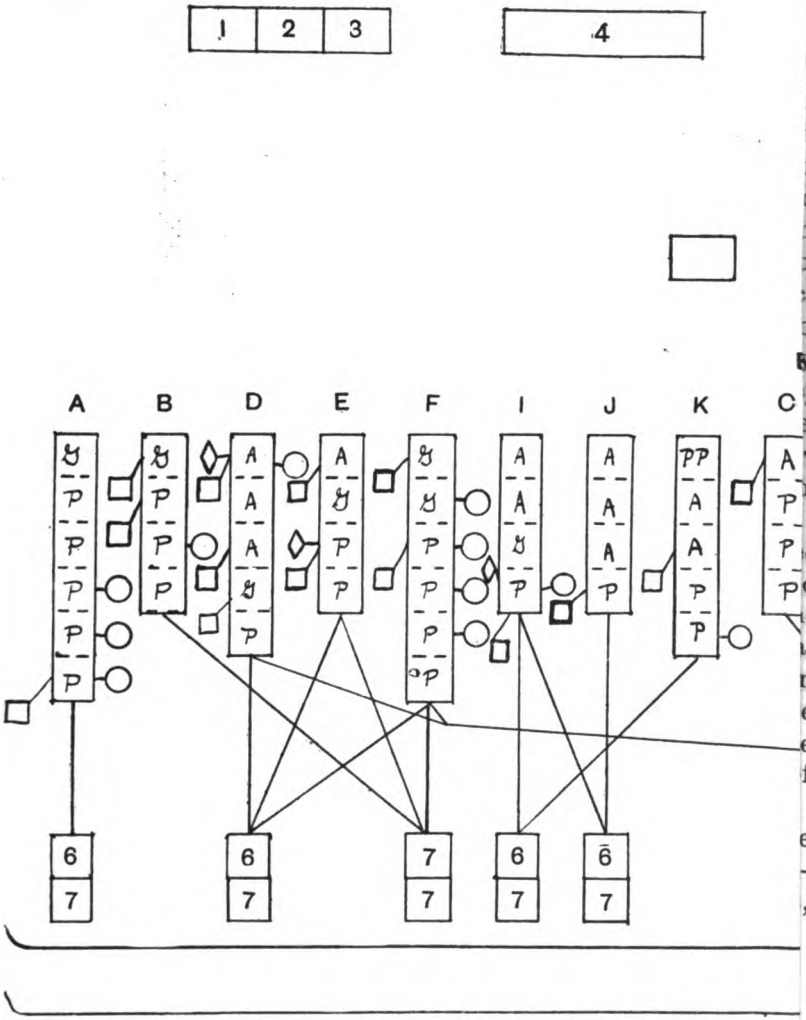

FIG. 7.—Scope of educational system. Each space represents an elementary b
elementary buildings represent kindergartens, ungraded, and special clas
4, college preparatory course—technical; 5, trade courses; 6, manual trainin

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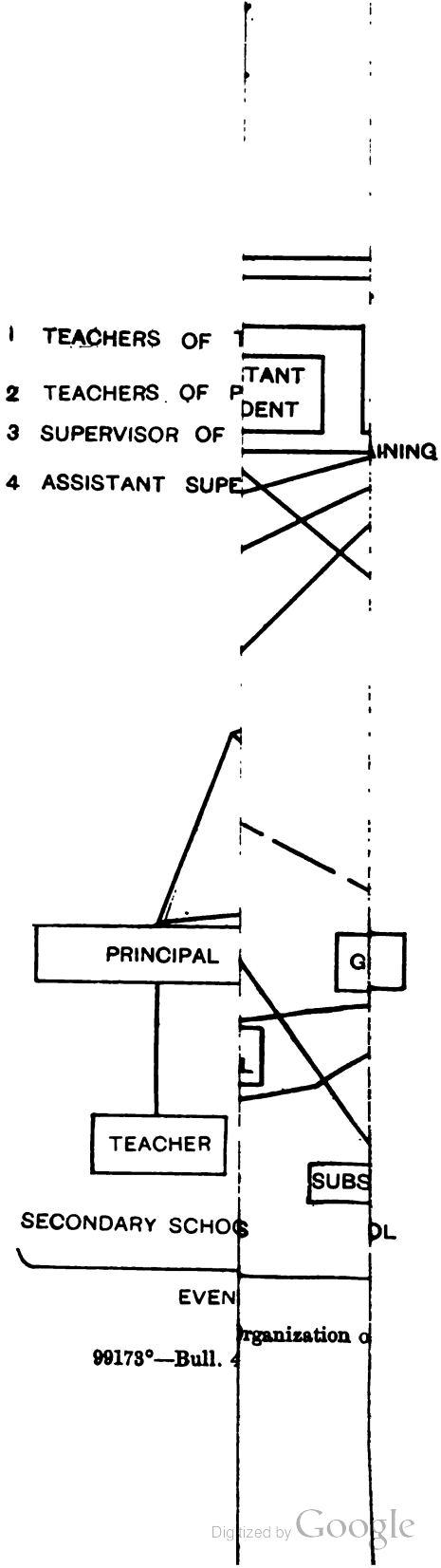

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ORGANIZATION OF ADMINISTRATION.

(See diagram opposite.)

On page 32 may be found a statement of the authority of the board of superintendents and of the superintendent. In fact, the superintendent and assistant superintendents act as a unit, with the superintendent as the directing head and the assistant superintendents as the extensions of his eyes and hands. The superintendent performs at will the identical functions that ordinarily would be performed by the assistants. In matters of routine upon which policies have been determined, the assistant superintendents act with freedom. If an unusual application of an established policy, a modification of such policy, or the determination of a new policy is involved, the matter is acted upon by the superintendent or after a meeting of the board of superintendents. Such conditions require very close personal relations among all members of the board of superintendents.

The supervisor of practice and her assistants form one of the three divisions of the training-school faculty. For matters pertaining to the practice teaching of training-school pupils or other things connected with the training school they are responsible to the principal of the training school, but the assistant supervisors of practice can be reached only through the supervisor of practice. Again, the supervisor of practice and her assistants are responsible to the superintendent alone in matters pertaining to the supervision of substitutes after they have completed the training-school course.

The broken lines leading to and from the group principal indicate that the desired relations have not as yet been effectively established. The vice principal exercises little control over the teachers, none relating to supervision of instructors.

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PROGRESS OF PUPILS THROUGH THE COURSE.

(See diagram opposite.)

Classes are formed each half year. The pupils are divided into three groups according to ability to perform the work whenever the number of pupils permits such division. Otherwise, into two divisions or not at all, as the numbers dictate. In certain groups particularly in one, the course of study has been adapted to each grade of ability. This may be considered as the ideal toward which all groups are approaching, although very imperfectly in some groups.

Pupils of highest ability are admitted to preparatory classes at the close of the sixth grade. Such pupils may complete the twelfth grade in five years, except those that enter the Polytechnic Institute. Graduates of this school are admitted, however, as sophomores to Lehigh and Sibley (Cornell), and those who have completed the eleventh grade are admitted as freshmen to these institutions. There are no preparatory classes for colored pupils.

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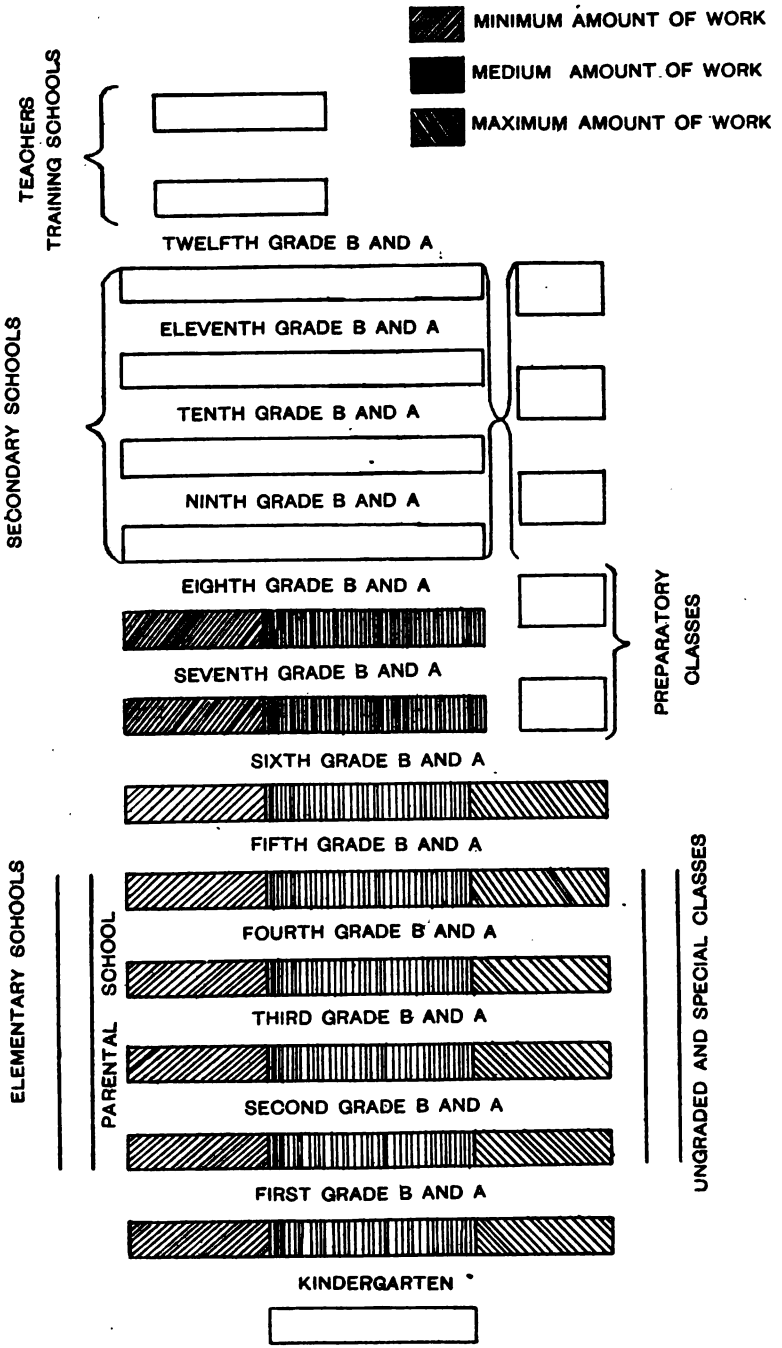

Fig. 9.—Progress of pupils through the course of study.

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CHAPTER III.

THE MAIN TOPICS OF THIS REPORT, RELATING TO TRAINING AND INSTRUCTION IN ELEMENTARY DAY SCHOOLS.

A. THE SYSTEM OF SUPERVISION.

CONDITIONS IN THE PAST.

At the time of the adoption of the new charter and the reorganization of the school department, as it appears from such information as we have gathered, the system of supervision for the schools of the city of Baltimore was altogether inadequate. There were at that time (1899) 1,802 teachers employed and 65,289 pupils enrolled in the schools. For general supervision of the work of this large number of teachers there was one superintendent of schools and one assistant superintendent. The size and method of election of the board of school commissioners at that time, and the limitations upon the powers of the supervisory officers, as well as the very magnitude of the school system, rendered it impossible for these two men to give an effective professional supervision to the schools of the city. The larger business and educational problems of the system as a whole naturally absorbed the greater part of their time and energy.

In the schools themselves there was one principal for each department, male and female, of each grammar and primary school; there was usually one principal, and sometimes two, for each floor of a building; and not infrequently there were, under this arrangement, from two to four principals to a single schoolhouse. Each principal taught a class, but where seven or more teachers were under his care, an assistant was provided for two hours in the day, during which time the principal was expected to supervise the work of the teachers. In practice, however, the principals exercised only nominal control over the few teachers in their school or division. They were principals in name rather than in fact. In some instances there was duplication of work in the same building and, although a uniform course of study was in existence, there was little of real organized unity.

There were supervisors of special subjects of instruction (music, drawing, sewing, and physical training), and they introduced something of uniformity and purpose into the teaching of these special subjects in the grades in which they were taught; but their work

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was of necessity but little related to the great bulk of elementary school instruction and management and probably influenced it but little.

Each high school had a principal of its own, who looked after its supervision. These schools, however, were but loosely related to the elementary schools. For a long time the high schools examined the pupils coming from the elementary schools to see if they were prepared for high-school instruction.

PRESENT POLICY AND PRACTICE.

With the reorganization of the school system following the adoption of the charter of 1898, a new system of school supervision was instituted. An experienced superintendent of schools was called from another city. The different schools were organized into a number of school groups, and two additional assistant superintendents were after a time employed. For each of the groups of schools a group principal, devoting all of his time to supervision and work related thereto and made responsible directly to the superintendent of schools, was put in charge. At present 104 of the 105 elementary-school buildings are arranged in 21 groups (18 white and 3 colored). These groups vary in size from one of 48 to one of 105 teachers, the average being 72 teachers.

The following table shows the number of elementary-school buildings and the number of teachers in each group:

Groups.	Buildings.	Teachers.	Groups.	Buildings.	Teachers.
A	6	79	O	4	48
B	4	63	P	5	61
C	4	56	Q	5	68
D	5	105	R	7	85
E	4	75	U	5	65
F	6	71	V	4	70
I	4	74	W	5	52
J	4	86	X (colored)	5	93
K	5	69	Y (colored)	4	71
L (not a group)	1	19	Z (colored)	6	63
M	6	67			
N	6	92	Total	105	1,532

A group of schools consists ordinarily of a central school, enrolling children in the upper grades, and a number of primary schools, whose pupils go to the central school after completing three or four years of work. In the newer and larger buildings, however, all of the grades are commonly found under one roof. All of the schools of a group are regarded as practically one school, being managed by one (group) principal. In disciplinary and executive matters the principal is assisted by one vice principal in each building. Each teacher is directly responsible to the principal, and through him to the superintendent.

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The introduction of the group system of supervision marked an advance toward effective supervision for the schools of Baltimore. The good results obtained under it were evident to the commission and were frequently mentioned by teachers who have worked under both systems. It has brought into the school system its first unifying supervision, except in the few special subjects of instruction for which special supervisors were already employed.

The number of such supervisors, compared with 12 years ago, is shown by the following table:

Special supervisors.	1899	1911
Music supervisors	2	4
Drawing supervisors	1	1
Assistants in drawing	18	10
Sewing supervisors	1	1
Physical-training supervisors	2	1
Physical-training teachers	8	5
Manual-training supervisors	.....	1
Totals	32	23

The special supervisors travel about from group to group, meeting the teachers of the city by grades rather than by groups, and instructing them in subject matter as well as in methods of presentation. The subjects covered by these special supervisors, however, added together do not represent more than 20 per cent of the work of the eight years of elementary-school instruction. For the 80 per cent or more of instruction remaining, and involving nearly all of the general administrative problems of group and school supervision, dependence must be had almost entirely upon the group principals.

So far as close personal supervision of the elementary schools by the superintendent of public instruction and his assistant superintendents is concerned, the size and extent of the school system of the city of Baltimore (about 1,550 teachers and supervisors being employed, with about 80,000 children enrolled, and the 105 elementary-school buildings being scattered over an area of approximately 30 square miles) make this manifestly impossible. If the superintendent and his three assistants should attempt to spend half a day with each teacher in the schools, and should do nothing else during the time the schools are in session during each year, it would require nearly four years and a half for each one to make the round once. It would require more than a year to make the round, if each teacher were visited by only one member of the board of superintendents, the members of that board devoting the whole of each school day to this business exclusively.

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Under these conditions the board of superintendents can at best only indicate a policy and procedure, in general terms, and must of necessity depend very largely upon the several group principals to carry such policy and procedure into effect within their respective groups. The group principals thus become, in a way, the key to the whole situation. In so far as they are educationally efficient and assume a helpful and cooperative attitude toward the school administration, much can be accomplished; but in so far as they are lacking in educational insight and effectiveness, or assume a different attitude, little or nothing of a constructive nature can be made effective. (See Fig. 8.)

CRITICISM.

The commission has been impressed with the large amount of general constructive work which has been accomplished, under such conditions, by the board of superintendents, with the cooperation of group principals. The first unfavorable criticism which we would present is that the supervision is inadequate in amount. This will appear from the following table, showing the provision for school supervision in Baltimore along with that in other cities with which Baltimore may fairly be compared:

TABLE 8.—*Ratio of teachers to supervising officers in cities of 300,000 population and over, 1910.*

	Teachers.[1]	Supervising officers.[2]	Number of teachers to one supervising officer.
New York	16,689	926	18
Chicago	6,104	286	21
Philadelphia	4,397	260	17
St. Louis	1,987	124	16
Boston	2,779	95	29
Cleveland	1,936	122	16
Baltimore	1,778	56	32
Pittsburg	1,371	53	26
Detroit	1,399	101	14
Buffalo	1,511	79	19
San Francisco	1,034	96	11
Milwaukee	1,150	70	16
Cincinnati	1,238	118	11
Newark	1,266	64	20
New Orleans	1,029	95	11
Washington	1,659	43	39
Los Angeles	1,227	83	15
Minneapolis	1,082	73	15

[1] Number of teachers in kindergartens, day elementary and high schools, schools for the training of teachers, schools for exceptional children, and teachers of special subjects.

[2] Number of superintendents, associate and assistant superintendents, principals of elementary and high schools, and schools for the training of teachers, who devote half or more than half of their time to supervision.

Some teachers were inclined to assert that too much uncertainty exists regarding the exact policy of the superintendent in respect to some important matters of instruction and administration. It would

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undoubtedly be well to make use of a more effective means for keeping the teachers in touch with the policy of the system. The usual method employed for acquainting teachers with the wishes of the superintendent is the circular of information which is mailed to vice principals, and by them posted on the bulletin board. Teachers' meetings are confined to a few groups, and meetings for teachers of particular grades are now unusual. To bring this all about, additional general supervisory officers should be provided.

The group system of school administration, while possessing certain advantages from the standpoint of the grouping and grading of children, is nevertheless at best a somewhat imperfect plan of school supervision. It is found in only a few cities—Boston, New Haven, Washington, Indianapolis, and Baltimore. Except in Washington, in none of the cities using the plan do the group principals have so many teachers to look after as in Baltimore, as is shown by the following table:

Cities.	Number of teachers to the group.		
	Average.	Highest.	Lowest.
Baltimore	72	105	48
Boston	(1)	(1)	(1)
Indianapolis	30	50	15
New Haven	45	55	35
Washington	91.6	113	85

[1] No data at hand.

The general practice elsewhere is to have a principal for each school building, and wherever the building has 10 or more teachers the rules of boards of education for the different cities generally provide that the principal shall have all of his time free for supervisory work.

We find that a teacher in Baltimore rarely submits the program of studies in her grade to any superior officer. There are often uneconomical arrangements of subjects, such as a penmanship period directly after opening exercises, or a physical-culture period following a recess.

Our second unfavorable criticism is that the supervision exercised by the several group principals seems to us extremely variable in quality, and accordingly lacking in anything like uniform professional effectiveness.

Group autonomy is one of the marked characteristics of the schools of Baltimore. It seems a safe generalization to say that there are about as many school systems as there are group principals. In many matters it is very desirable that a freedom of action on the part of group principals should exist. A clear distinction, however, should be made between liberty to do more than is required and

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license to do as one pleases. Local and individual liberty has in the past been excessive in the schools of Baltimore. The school administration has been compelled to proceed with great caution, to use suggestion instead of authority, and to exercise an undue amount of patience in dealing with individuals. What superintendents of schools elsewhere are accustomed to ask of principals and teachers, and to expect them to do—not because it is a command, but because the judgment and larger knowledge of the executive officer is respected, and his authority is upheld—the superintendent in Baltimore must offer largely as a suggestion, explain its merits to his group principals, and then frequently wait for them voluntarily to put the suggestion into effect. The different school groups naturally reflect to a large degree the spirit and attitude of the group principal. In the majority of the groups there is an apparent willingness on the part of the principals to cooperate with the superintendent in matters which are deemed best for the system. In some cases, however, there is an apparent lack of readiness to follow explicit directions. It seems to us clear that in some of the groups the group supervision fails to second, vigorously and intelligently, the supervision from the central office. Such supervision is that of the letter rather than that of the spirit, and the teachers of such groups, though faithful and earnest, lack that pedagogic insight and professional enthusiasm which is so contagious when possessed by a school principal.

We may repeat that the commission does not concern itself with individuals. Its criticism is wholly impersonal, such observation as it has made of individual instances being used solely for the formation of judgments concerning the system as a whole, these judgments in turn serving as the basis for recommendations concerning possible improvements.

Baltimore has now to integrate the different school groups into a united system. Between the schools of each group there is a uniformity that does not exist between the schools of different groups. In other words, the unification which has thus far been attained is a vertical one. The groups need now to be brought together by a horizontal unification.

RECOMMENDATIONS.

The commission believes that one of the most pressing needs of the schools in Baltimore is a very material increase in the supervisory force. While the commission does not desire to make too specific recommendations, it does, however, believe that it should indicate a few of the more obvious and immediate needs. These needs may be enumerated as follows:

(*a*) An increase in the number of assistant superintendents, one of whom might be the principal of the white teachers' training school.

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(*b*) The creation of a staff of primary school supervisors and some increase in the staff of special supervisors.

(*c*) In all elementary schools having 20 or more teachers, with all of the grades represented, it might be well to have a principal to devote all of his or her time to the supervision of instruction.

The question of cost naturally enters into all of these proposals. In a previous section (pp. 42, 43) it was shown that in order to spend an amount comparable to the median amount spent by other cities for supervision in 1908, Baltimore would have been required to spend from $35,000 to $45,000 more than was then used for this purpose. It has been estimated by the commission that the total expense of securing the additional assistant superintendents and supervisors suggested under *a* and *b* would be less than $35,000. This would represent an added one-fourth of 1 per cent to the present cost of the school system, an amount that is insignificant when compared with the benefits to be derived from it.

The commission recommends that the authority of the board of superintendents in all matters pertaining to supervision should be materially strengthened. The policy of suggestion and recommendation which this board has heretofore followed has much to recommend it, but it has decided limitations, and progress under it, though substantial, is frequently slow. It is desirable that the schools of Baltimore make more rapid progress than has thus far been made, and one of the means for accomplishing this must be this increased authority.

It may not be out of place for the commission to suggest that in the primary schools the superintendent needs for his assistants a small group of capable women of experience. The work of primary schools is essentially and naturally the work of women. It is needless to say that such women should be well trained, broad-minded, sincere, and sympathetic. To secure such women good salaries must be paid, for the supply throughout the country is by no means equal to the demand.

In order to secure persons properly qualified for all of these important positions, larger salaries than are now paid should be provided. There should be no mistaken local pride about going outside of Baltimore to secure such persons, and it would be well if some were drawn to Baltimore from other city school systems. The new points of view and the new methods of work which such individuals would bring would tend to greatly improve the school system.

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B. THE TEACHING FORCE AND ITS TRAINING.

CONDITIONS IN THE PAST.

The commission has been repeatedly and reliably informed that prior to 1899 considerations other than special aptitude for the work of teaching frequently controlled the election of new teachers. No professional preparation was required, and then, as now, the city of Baltimore furnished the entire supply of new teachers. Many of those who began teaching under good principals, and who possessed the right attitude toward the work, developed into very good teachers. On the other hand, those who received little help or encouragement, or those to whom the work of teaching made no strong appeal, became formal, stereotyped, and professionally unprogressive teachers. The commission has met examples of each kind of teacher in the schools of Baltimore.

Of the 1,788 teachers in the service of the city of Baltimore on January 1, 1911, the terms of service by decades are as follows:

Entered prior to 1860	5
Entered between—	
1860 and 1869	52
1870 and 1879	137
1880 and 1889	292
1890 and 1899	535
1900 and 1905	329
1905 and 1911	438

More than 1,000 of the teachers now employed began their service prior to 1900. These, with few exceptions, have received their entire professional training while serving in the schools of Baltimore, and consequently have no intimate knowledge of the practice in other large cities.

Shortly after the adoption of the new charter, in 1898, efforts were made to improve the professional condition of the teachers. These efforts extended in four directions:

(1) Improved and increased supervision. (2) City training schools for teachers. (3) Competitive examinations for admission to the eligible list of teachers. (4) Promotional examinations for teachers in service.

The first of these means was treated in Section A; the remaining three belong to this section.

CITY TRAINING SCHOOLS.

In September, 1851, the eastern and western normal classes were organized. They were established for the benefit of teachers; and the graduates of the female high schools having passed the full term and desiring to adopt the profession of teaching were allowed to remain another year in this class to receive instruction in the theory

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and practice of teaching. All newly appointed teachers were required to attend one of these classes for six months. These classes were discontinued in 1858.

In 1872 the board of commissioners organized a normal class for the purpose of giving instruction in the theory and practice of teaching. This was placed under the supervision of an experienced teacher with a corps of competent assistants. The class met on Saturdays. This class was continued until 1881, at which time "the exercises of the normal class were suspended during the year in consequence of objections made to the methods of instruction." Almost immediately there was a strong agitation for the establishment of a teachers' training school. Year after year the board of school commissioners renewed their recommendation on this matter to the city council, but without effect. The city continued to face a somewhat unusual situation in regard to the supply of teachers; it could not depend upon strong State normal schools for the training of its teachers; and the low salaries offered, coupled with the strong feeling of local pride, prevented the city from drawing trained teachers from other cities. In 1900, a concurrence of favorable circumstances enabled the city to start a training school for the first year at an expense of a little over $3,000, and arrangements were made for the opening of such a school in January, 1901. Under the circumstances, the only recourse was to establish such schools for both races and to require that all future teachers complete the course of preparation provided by these schools, or present evidence of having equivalent preparation.

The principal of the Teachers' Training School for white teachers has a triple faculty of assistants, namely, (1) the assistant teachers of pedagogic subject matter and method in the training school itself; (2) the teachers of practice classes and the vice principals with whom student teachers are placed for practice teaching; (3) the supervisor of practice teaching and the assistant supervisors of practice teaching, in so far as their work concerns the practice teaching of student teachers. The principal of the Teachers' Training School has authority in all matters pertaining to candidates for admission to the service, both as to theory study and practice teaching, from the time of the candidate's entrance into the junior year of the training school up to the time of the candidate's passing the "professional examination" which gives admission to the substitute list.

At first the training course covered but one year; later it was extended to two years, and graduation from a high school was required for admission. One-half of the time is devoted to practice teaching in the schools under the direction of practice teachers. The course is planned as a combination of theory and practice. It aims to give technical training and to develop professional aptitude, and thereby to assure growth in scholarship and professional skill. The school

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grants no diplomas of graduation. Should the number completing the training-school course ever largely exceed the number needed by the schools, a condition which may exist under an increased salary scale, the advantage of this provision will be apparent. Those who complete the training-school course are placed on the eligible list.

ADMISSION TO THE ELIGIBLE LIST OF TEACHERS.

In 1887 the board of school commissioners passed a rule which made those who were graduated from the city college, high schools, and State normal school with the requisite average, and those who passed the semiannual examinations, eligible for appointment as teachers for 10 years; if selected for promotion, they were eligible to any position in a primary or grammar school. The records show that the rules were frequently suspended in order to allow the names of applicants to be placed upon the list of eligibles without complying with the rules relating to the eligibility of candidates. At present every candidate for a position in the elementary schools of Baltimore must pass the competitive examination, which consists of two parts. The first part is professional in nature and covers, as far as possible, the prescribed course in the teachers' training schools of the city. The second part consists of a test in actual teaching done under ordinary classroom conditions; first as substitute of class 2, and afterwards as substitute of class 1. After the candidates have demonstrated ability as substitutes in class 2, the superintendent is required to place them in class 1 in such numbers as the needs of the service may require. Candidates serve as substitutes in class 1 for one year. The records of both parts of the examination are of equal value in fixing the final average assigned the candidates when they are placed upon the graded list. The superintendent of public instruction reports the names of all candidates placed upon the graded list to the board of school commissioners. He also reports the names of all substitutes of class 1 who fail to demonstrate their aptness for teaching at the end of the year's trial, with a recommendation for such action as he may deem advisable. All permanent appointments of teachers in the elementary schools are made from the regular substitutes, and vacancies in the staff of substitutes are filled from those who have the highest rating on the graded lists.

PROMOTIONAL EXAMINATIONS FOR TEACHERS IN SERVICE.

In 1902 the board of school commissioners had an unexpended balance of about $10,000. It was decided to use this in increasing the salaries of the best teachers in the school system. On the assumption that the good teachers were equally divided between the various groups, each group principal was asked to name, in order of merit, a few of his best teachers, who had been teaching not less than 5 years

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and who were receiving salaries less than $600 per year. The board of superintendents visited the teachers thus named and others and selected 100 who were invited to take an examination which might be written in answer to set questions subject to the usual limitations of time and place, or which might take the form of an oral discussion of a paper of not fewer than 1,500 words prepared for the purpose. In all cases the second plan was chosen—the thesis and its defense. The increase in salary was based on merit as determined chiefly by inspection of regular school work. The examination served merely as an evidence of the possession of ideas and of the ability to express those ideas in clear and concise English. After some rejections and substitutions 100 teachers were thus chosen, each of whom received an increase in salary.

In 1904, 150 teachers were advanced in the same way. In 1905 the board of school commissioners received an appropriation of $78,000 to be used in increasing the salaries of teachers. At this time the so-called promotional examination system was adopted. In addition to the preparation of a paper such as had heretofore been required, teachers desiring to compete were now required to pass an examination in English. It is stated that the reason for introducing this part of the examination was the very poor English used in many of the papers which had been submitted. The examination now consisted of two parts, the first of which was an examination in English and the second a professional examination similar in nature to the first examinations that were given. By these examinations teachers were promoted in salary but not in position. The maximum annual salary for teachers who had not taken the promotional examination was $504. When part 1 of the promotional examination was passed, the teacher's salary advanced to $552 the first year, and unless an adverse report on her work was made, increase was automatic to $600 the second year. After receiving $600 for at least one year, those who had passed part 1 of the promotional examinations and who continued to do satisfactory work were eligible to advance to $700 per year by three annual increments of $24, $36, and $40, respectively, provided they had passed part 2 of the promotional examinations. Certain provisions were made for those teachers who had been in service prior to the establishment of these examinations. In no case was the salary of a teacher decreased.

These promotional examinations and the scale of salaries are still in force. The records seem to indicate that almost from the first there was a strong opposition on the part of the teachers to the examinations for promotion. The following table shows the number of those who have passed parts 1 and 2 of the examinations from 1903 to 1911, inclusive:

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Years.	Part 1.	Part 2.	Years.	Part 1.	Part 2.
1903		109	1908	50	24
1904		145	1909	50	27
1905		20	1910	54	35
1906			1911	18	14
1907	70	99			

While but few large cities are reported as having promotional examinations for certain increases in salaries, this small number includes some of the most progressive educational systems of this country. The list so far as our information goes is as follows: Chicago, Ill., Boston, Mass., Baltimore, Md., Cincinnati, Ohio, Kansas City, Mo., and Paterson, N. J.

CRITICISM AND RECOMMENDATIONS.

(*a*) *Training schools.*—The training school for colored teachers is well located. It has the beginnings of an equipment for teaching and has good practice-school facilities. The training school for white teachers, however, is in a building poorly adapted for the purpose of a training school. It is unattractive and poorly equipped. The salaries in this school are not what they should be to attract and hold the best teachers. There has been a lack of coordination between the different divisions of the training school faculty. The students who become student teachers find that the methods and devices they have been taught by the theory teachers are not always those which the supervisors of practice require.

These training schools are now and probably will continue to be essential to the building up and the preservation of a real professional spirit among the members of the teaching force. It is important, therefore, that they should be made equal to the best of their kind. The training school for white teachers should be in a building suited to its purposes.

It should be officered and equipped in such a way that it can be made the center of the educational life of the public-school system. Among them should always be some who have had experience outside of the schools of Baltimore. The amount of purely apprenticeship work done during the two years of the course might to advantage be somewhat shortened, and in its place more attention be given to such subjects as will enlarge the professional conceptions of the students. It is greatly to be desired that in the pursuit of such subjects they should gain a clear idea of the service of education to a democratic society, a certain loyalty to educational institutions and ideals, and a good beginning for long-continued growth in the occupation of teaching. In order to make these changes as effective as possible it is desirable that the influence of the training school in the supervision of its graduates after they have left the school should be increased.

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The commission believes that opportunities for study on the part of teachers in service should be extended. It therefore heartily approves of an arrangement which would give the superintendent power to establish such classes. These classes should be formed in both pedagogical and academic subjects. In the opinion of the commission attendance upon professional classes should be made compulsory for those teachers whose work is not reasonably satisfactory.

One of the great needs of the schools in Baltimore and elsewhere is more accurate and broader scholarship as well as professional attainments on the part of teachers. Progressive teachers recognize these facts and are ready to respond if opportunities are presented. The fact that a great university and a woman's college of high grade are located in Baltimore gives the school authorities exceptional advantages for the organization of study classes.

(*b*) *Eligible list.*—The commission recommends that increased attention be given to securing teachers who have had training and experience outside of the schools of Baltimore. We believe that if Baltimore could draw into its teaching force a number of first-class teachers from the better school systems of the United States there would in a short time be a general change for the better in the outlook of the teaching force. The superintendent should be free to go outside of the city in the selection of teachers, in accordance with the prescribed standard of qualifications.

(*c*) *Salaries.*—The salaries paid the teachers in the elementary schools of Baltimore are decidedly low, as compared with the ordinary scale of living expense for those in an occupation of this grade of responsibility, and as compared with the salary schedules of other cities. The most significant facts that we are able to present by way of a comparison between Baltimore and other cities in this particular are set forth in the following table:

TABLE 9.—*Salaries of elementary school teachers in cities of 300,000 population and over.*[1]

Cities.	Minimum.	Maximum.	Cities.	Minimum.	Maximum.
New York	[2] $600 [3] 900	[2] $1,400 [3] 2,400	Buffalo	$500	$900
Chicago	650	1,125	San Francisco	840	1,224
Philadelphia	520	920	Milwaukee	540	1,020
St. Louis	600	1,032	Cincinnati	600	1,000
Boston	552	936	Newark	580	1,100
Cleveland	500	1,000	New Orleans	450	700
Baltimore	444	700	Washington	600	1,350
Pittsburg	450	900	Los Angeles	744	1,080
Detroit	500	1,000	Minneapolis	600	1,000

[1] Compiled from data supplied by superintendents. [2] Women. [3] Men.

In view of these comparisons it seems clear that Baltimore will need to provide for a considerable increase in the salaries of these teachers. It would carry us beyond the proper scope of this report if

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we were to advise concerning the salary scale that should be adopted. The figures presented above will, however, be found suggestive at this point.

(*d*) *Promotional examinations.*—The action of the board of school commissioners in providing that an increase in salary at certain points should depend upon the passing of the so-called promotional examinations, has given rise to one of the most acute of the controversies which have of late affected the Baltimore school system. We have seen with regret many indications that personal animosities have entered so largely into this controversy as to have overshadowed the simple question of administration which is involved. The commission, however, is not concerned with any of the personal aspects of the matter, but only with its general bearings. We have very attentively considered these general bearings in the light of argument freely presented from both sides of the question.

The question seems to us an incidental rather than a fundamental one. The permanent interest of the public in the schools is the interest in a good system of education. It is interested in seeing the teachers receive such salaries, within reasonable limits as will contribute to this result; and it is interested in such requirements regarding teachers' qualifications as will best assure this result. The Baltimore school authorities have under their direction a body of teachers, in permanent tenure, who show serious inequalities as regards teacher qualifications. Having at their disposal only a limited fund for the increase of teachers' salaries, they apparently used their best endeavor to give the increase to the better equipped and the more progressive of those teachers. Such action seems to us abundantly justified.

That the opposition of a large number of the teachers to the plan adopted for that purpose should have become a serious element in the situation, even reaching the stage of a deadlock, through the refusal of many of them to qualify for the higher salary on the conditions prescribed, presents a practical administrative problem, to be dealt with in practical ways. That is, the difference seems to us to relate more to a method than to a principle. A careful consideration of the arguments presented by those in opposition to these examinations fails to reveal any deeper principle than that the plan will cause dissatisfaction on the part of those who under its operation do not receive the desired increase in salary. As a mere question of method, the difference seems to us one that should be settled in conference, with a readiness to make concessions from both sides.

A real principle lies back of the question of method, and it is one concerning which there should be no difference of opinion. It is the principle that the schools should render the best possible service to

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all of the people and that the teaching force should be made as efficient as possible to this end.

The board of school commissioners and the company of teachers who have opposed the promotional examinations should both keep this principle in view. And mutual concessions, if such are made, should aim at the best working method that can be devised for carrying this principle into effect.

CHARACTER OF THE TEACHING IN GENERAL.

It has been difficult in the brief time at the disposal of the commission to form a wholly satisfactory estimate of the character of the teaching in the elementary schools. There are so many elements which make up efficient teaching that it would be necessary to make a prolonged stay in the schools in order to form accurate conclusions as to the effect of the teaching upon the children of the city.

The commission, however, is able to state some of the conclusions it reached as a result of its study and observation in the large number of schools which the different members visited.

First. There is excellent teaching to be seen in the Baltimore schools. Such teaching is by no means common here; but it should be added that nowhere is such teaching to be found to the extent that might be wished. Fine teaching is an art, in Baltimore and elsewhere, and is therefore rare.

Here and there, in both lower and higher grades, the commission found clear, intelligent, forceful teaching, and correspondingly alert, active children who are making very substantial progress in their work. In certain districts this fine teaching was more in evidence than in other districts.

Second. There is some very poor teaching; not in a large number of schools, but nevertheless in too large a number, if the interests of the children are paramount. In a few classes it is questionable whether the children are gaining anything from their school life. This poor teaching is due largely to the presence in the schools of a few teachers whose usefulness has seriously declined, whatever their former usefulness may have been. In a half dozen rooms the children were actually being harmed by being in school, for they were contracting habits of idleness, inattention, and disorder. Some way should be found of dispensing with teachers of this class.

Third. There is a large amount of teaching which may be classed as ordinary or mediocre. It is mechanical and perfunctory. The work is without that life and spirit which is found in schools of high rank in Baltimore and elsewhere. In these schools is to be found a routine of exercises in which the children do not appear to be vitally interested.

The work of these teachers, however, is not unproductive of good results. The order in their rooms, as a rule, is good; the discipline

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can not be seriously criticized; the children have confidence in the teachers; the teachers are interested in their work. The pupils, too, make progress in the conventional work of the school. The schools are worth to the community much more than they cost.

The point which the commission seeks to emphasize is this, that while the work of this class of teachers is of value, it is not so valuable as might be wished, nor as might reasonably be expected.

It is important to ask what is the underlying reason for the condition one finds in these schools. From such study as the commission has been able to give to the matter, we are of the opinion that it is largely due to the presence in the schools of a large number of untrained teachers. The schools still suffer from the fact that the systematic training of teachers did not begin in Baltimore until 1900. No other American city of importance was so late in establishing a normal training school of the modern type as was Baltimore. As a consequence it is probably true that no other American city of the same class as Baltimore has so large a proportion of untrained teachers in the service of the elementary schools.

The commission is not unaware of the fact that there are some excellent teachers in the Baltimore schools who were untrained for teaching. These are teachers of natural ability who have been quick to learn from experience. The fact remains, however, that the preparation afforded by a well-conducted training school is needed for schoolroom efficiency, taking ordinary high-school graduates as they are. Of course the theory that a graduate of a high school is fit without special training to teach school has long ago been discarded in Baltimore, as it has been elsewhere.

In view of these general considerations regarding teaching and teachers, especial attention is called to the considerations brought forward in the preceding sections touching provisions for the improvement of the teaching force of the city.

C. THE ELEMENTARY SCHOOL CURRICULUM.

HISTORICAL SUMMARY.

As early as 1855 a definite curriculum had been set for the public schools of Baltimore. In the elementary schools, that is, the primary and grammar schools, provision was made for teaching reading, penmanship, spelling, etymology, grammar, composition, arithmetic, algebra, geometry, mensuration, bookkeeping, geography, natural philosophy, and history. Algebra, geometry, mensuration, and bookkeeping were omitted in the schools for girls.

In 1883 the board adopted a detailed course of study covering three years for the primary schools and three years for the grammar schools. At that time arrangements were made for teaching drawing, although drawing had been taught in the high schools since 1846

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and in the primary schools since 1872. Vocal music had been taught since 1843.

In September, 1885, a course was adopted which provided for eight years in primary and grammar schools. In this course provision was made for elementary science, including physiology, and United States history, which was introduced in the seventh year. The first part of algebra and four books in geometry were taught.

The course of study used in 1898 provides for the definite teaching of sewing to girls, beginning in the third year. This subject had been introduced in 1892.

A manual training school was established in 1884. The sixth, seventh, and eighth grades were taught in this school. Later these grades were dropped from this school and provision for teaching manual training to the boys was made in certain schools which are known as manual training centers. In these centers girls are taught cooking or domestic science.

Physical training has had a place in the curriculum since 1898.

It will be seen by an examination of this list of subjects taught in the elementary schools and comparing it with a corresponding list taught at the present time, that no subjects have been added to the curriculum since 1898.

It is somewhat commonly assumed that the schools are now attempting to teach more subjects than were taught 10 years ago. This assumption is not borne out by the facts.

The subjects now taught in the Baltimore schools correspond to those commonly taught in other cities, large and small, throughout the country.

The following subjects occur in the Baltimore course of study and in that of each of the cities with which Baltimore is compared: English, including language and composition, spelling, grammar, and penmanship; history; geography and nature study; arithmetic; music; physiology and hygiene; drawing; and manual training and domestic science. New York outlines a course in ethics; Chicago has a "Chicago course" and also a course in humaneness; Boston has a moral-training course; Buffalo has a course in agriculture which is a continuation of the nature-study course. The fact that these subjects are named specifically in only the courses of study for the above cities does not mean that other cities are not giving some attention to them, but the work is not as definite as it is in the cities above named.

METHODS EMPLOYED IN MAKING THE COURSES OF STUDY.

The methods employed in making the present courses of study for English, mathematics, geography, and history are noteworthy. All grade teachers through their principals were notified to criticize the old courses of study, and to offer suggestions for improvement by omit-

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ting, adding, or simplifying requirements. These suggestions were given to committees of members of the superintendents' round table as the basis from which new outlines were to be derived. These new outlines, tentatively worked out by the committee, were put into multigraph form and abundantly discussed in round-table meetings, and also in group meetings of the various grade teachers concerned. The new outlines were then put into the schools for one year's trial, and at the end of the trial year further suggestions for improving the same were requested. The board of superintendents embodied the best of these suggestions in the outlines before finally presenting them to the school board for adoption. Following the adoption of the outlines the board of superintendents freely answered any query coming from the grade teachers. Whenever a query was received the answer was put in multigraph form and went to all of the teachers of that particular grade.

TIME ALLOTMENTS IN THE SEVERAL GRADES.

Each teacher in the Baltimore schools is required to post a schedule of her work in a conspicuous place in the room so that the children may see it and that the principal and other supervisors may learn, without interrupting the teacher, when to come to the room to observe a given exercise. The only explicit directions given the teachers in regard to the time allotments are contained in the following extract from the general directions.

> Except in the few instances * * * , or for extraordinary reasons, the following time limits are not to be exceeded: Grade one, 15 minutes; grades two, three, and four, 20 minutes; grades five and six, 25 minutes; and grades seven and eight, 30 minutes. Painting, drawing, or construction may require 30 minutes in grades one to six.

It has been contrary to the policy of the superintendent to prescribe the amount of time per week that a teacher must devote to the various subjects, excepting drawing, music, sewing, and physical training. In practice, however, the commission has found that the suggested schedules in the Supplement to the Outline of Studies for the Elementary Schools, 1906–7, is very generally followed by the teachers. Its use at any rate is sufficiently general to warrant the commission in forming a schedule of time allotments according to these schedules. The time allotments in particular subjects is given in connection with the treatment of the subjects themselves and need not appear at this point. The following table shows the percentage of the school time allotted in the suggested schedules to the subjects that are generally called the essentials, namely, English, including reading, writing, spelling, and language; arithmetic, geography, and history, which are here designated as the "old" subjects. Similar

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allotments in certain other subjects are also shown, which are here designated as "new" subjects, such as drawing, manual training, etc.

TABLE 10.—*Percentage of school time devoted to old subjects and new subjects.*

Cities.	Old subjects.	New subjects.	Cities.	Old subjects.	New subjects.
New York	62.48	37.52	Baltimore	77.90	22.10
Chicago	52.60	47.40	Pittsburg	81.00	19.00
Philadelphia	67.60	32.40	Detroit	83.80	16.20
St. Louis	70.87	29.13	San Francisco	79.90	20.10
Boston	73.36	26.64	Milwaukee	75.45	24.55
Cleveland	79.55	20.45	Cincinnati	76.69	23.31

One feature in the derivation of the time allotments in Baltimore deserves particular attention. The time allotment given in the tables is that suggested for the year 1906–7. In the first grade the suggested allotments covered both forenoon and afternoon sessions. At present the first grade pupils are not required to come back in the afternoon in most instances except for the special drill work. This of course influences the amount of time devoted to the various subjects. The proportion of time, however, used for the various subjects is not influenced by this change in the length of the school day. Since comparison is to be made with other cities in which the day consists of two sessions, it has seemed advisable to leave the allotment in the first grade in Baltimore as it stands in the suggested schedules. Therefore, the actual time indicated in the tables will not be correct, but the percentage of time is approximately correct.

Criticism.—Baltimore is the only one of the cities considered from which information could be obtained that does not have a definite time allotment for the various subjects. It should be stated, however, that virtually Baltimore has such an allotment. It is in the form, however, of a suggestion rather than an explicit direction.

The commission gives its unqualified approval to the time allotment for recitations in the ordinary subjects in each of the several grades.

This schedule is in agreement with the prevailing practice elsewhere, and, moreover, it is in accord with the results of investigations of child specialists as to the length of time which should be given to recitations.

SUBJECTS IN DETAIL.

The Language, or English, Group.

Under this heading, the following closely related subjects are included: Reading and literature, spelling, composition, grammar, and penmanship.

The plan of work for English instruction is laid out in a pamphlet of nearly 200 pages, entitled "The Course of Study in English." This

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pamphlet presents the ideals and practice of the schools with reference to teaching the various branches of English instruction.

After examining this pamphlet carefully, the conclusion is reached that the English course has been worked out with care and intelligence, and in its content is in general accord with the theory and practice of teaching English which prevails in the other large cities.

An attempt is made in the course to establish a correlation or connection between the various branches of English instruction and the remaining subjects of the curriculum.

> Not only the resources of literature are to be drawn upon for English lessons, all other studies of the curriculum furnish stores of material rich in content, and therefore of vital interest. (Course of Study, p. 25.)

There is a good presentation of the importance of oral composition, and suggestions are made for the teaching of this important but much-neglected branch of English instruction. No better statement of aim in the teaching of oral English can perhaps be found than this, from the Course of Study:

> But in every grade the teacher should have regular practice for the development of ease and fluency in talking, should give to the children an increasing vocabulary, should lead them to acquire the habit of using correct forms of speech, should insist unceasingly upon a clear and distinct utterance.

Detailed suggestions are made for teaching the difficult art of written composition, which if followed must be productive of good results in the schools. It would not be easy to find a more rational statement of procedure than the following, taken from the Course of Study:

> All lessons in composition should be based upon the principle that thought content must precede any expression, and that oral exercises should precede written ones. A child's habits of oral expression tend to create habits in written expression; and after a time the power to write his thoughts clearly and vigorously will increase his power to talk better and more coherently. The art of composition is a difficult art. Facility in expressing one's thoughts with precision and grace comes only by practice under skilled guidance, and it is therefore recommended that a brief period be given daily to written composition. This does not mean that in the upper grades there should not be an occasional long composition.

In treating the language group it seems advisable to give particular attention to those parts of the group which have been most freely criticised before the commission. It has been repeatedly asserted that not enough time has been devoted to grammar. The term "grammar" in this case needs careful definition. In Baltimore, as in other cities, the course of study calls for the teaching of grammar in all grades, but in the lower grades it is to be taught incidentally and in connection with other subjects. The course of study provides

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definitely for systematic language training before the seventh year is reached. We quote:

In addition to this continual incidental training in correct language forms, there must be special daily lessons in the use of good English.

Through the upper grades special directions are given for work toward the improvement of the pupil's sentences.

During the first six grades the language lessons and composition exercises, both oral and written, will give without formal grammatical study most of the grammatical facts of the language.

In the upper grades, however, the subject is to be taught either by the use of texts or otherwise in a definite manner or as the exact subject matter of grammar. The following table shows the year in which this definite study of grammar begins in the various cities:

TABLE 11.—*The year of the course in which the study of grammar is begun.*

	Year.		Year.
New York	6	Pittsburg	4
Chicago	7	Detroit	7
Philadelphia	6	Buffalo	7
St. Louis	5	San Francisco	7
Boston	7	Milwaukee	7
Cleveland	6	Cincinnati	6
Baltimore	7		

The commission believes that there is abundant authority for deferring the formal study of English grammar until the latter part of the grammar-school grades. Those who have investigated the subject believe that the formal study of grammar should not be undertaken by young children. Grammar is an abstract subject and makes severe demands upon the intellectual powers. To force the study of the subject upon immature minds is productive of neither intellectual training nor of facility in the use of good English. The commission believes that there is as much study of formal grammar in the Baltimore elementary schools as the pupils may be expected to "apprehend and apply."

Reading.—The suggestions and directions for teaching reading in the course of study are excellent and the commission feels are in accord with the best prevailing practices elsewhere.

In the course of study the following statement is found:

The material at first should be only those sentences which the child knows and uses in speech. Gradually the teacher will present sentences using such additional words as are to be found in the first portion of the primer which the child will use later. The sentence is the unit of reading. Later, by the process of analysis, the individual words become known as words, and are afterwards analyzed into their phonic and alphabetic elements. The process of learning to read should be conducted in carefully graded steps. For the first 8 or 10 weeks all the reading should be from the blackboard.

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Definite drills in phonics are continued through the first five grades. Reading texts are used in the first six grades, but beginning with the sixth grade literary wholes are introduced.

The complaint is made that reading is not thoroughly taught in Baltimore in conformity with the established standards of large cities. The Milwaukee course of study for 1909 has the following:

> The first steps in teaching little children to read are more easily taken if the children are taught to recognize at sight a limited number of words, used from the first in easy sentences. This plan is usually spoken of as the "sentence" or "thought method," and is a modification and improvement of the "word method" of teaching reading.

School Document No. 8, 1909, Boston public schools, a preliminary course of study (p. 37), gives the following directions for teaching reading in the first grade:

> Lessons from the blackboard: (*a*) Short, simple sentences interesting in content and connected in thought, so varied as to prevent monotonous repetition and reciting from memory. (*b*) Study of phonic elements, including phonograms.
>
> NOTE.—Children should read easily from the board, using a good vocabulary, before attempting the use of books. In all lessons, from the board or book, thought getting should be the important feature.

Careful study of the courses of study of the various cities shows that the "sentence" or "thought method" of teaching reading is employed in all; that this method is supplemented by definite drill in phonics; that the blackboard and chart is used in beginning the teaching of reading, and that in the upper grades whole literary masterpieces are introduced to take the place of reading books. In all these particulars Baltimore's course of study is in full accord with the courses for other cities.

Penmanship.—The vertical system of penmanship was introduced in the Baltimore schools in 1898, and its use was continued until 1910. Various criticisms have been directed against the character of this writing. Recently the system has been changed so that now the children begin in the first grade with the large round forms characteristic of vertical writing; in the second grade the forms are slanted slightly; as the child progresses the slant becomes more pronounced until the writing becomes what is known as the "medial slant." It is probable that the system now in use will correct any deficiencies that characterized the old system.

The commission is of the opinion that the penmanship of the pupils in the Baltimore schools is of average quality in comparison with that of pupils in other important cities of the country. The commission believes that the successful teaching of penmanship is an art which requires not only intelligence and teaching skill, but which requires, too, the application of certain psychological principles.

Spelling.—Spelling has been taught in the Baltimore schools by the so-called "flash method." One finds upon examination of the course,

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however, that this is by no means the only method of teaching spelling that prevails in the Baltimore schools. This method is suggested, it is true, but no teacher is obliged to follow it to the exclusion of other methods which make a larger appeal to her judgment.

A spelling book is used in three grades—the third, fourth, and fifth. In other grades teachers are asked to make use of words commonly misspelled by the pupils.

It is difficult to see how exception can be taken to the following statement made in the course of study:

> It is to be emphasized, however, that the words children should learn to spell correctly are those words they need to use in their own daily intercourse and writing and not artificially constructed lists of words illustrating the anomalies of English orthography.

Because a spelling book is not used in every grade, it is no indication that spelling is not taught. There is considerable divergence of opinion among educational authorities as to whether the teacher should find her material for teaching spelling in a spelling book, or in the words which children commonly misspell in their written work.

The method of teaching spelling has been criticized and the statement made that it is not in conformity with the established standards of large cities. The following table shows the methods employed in 11 of the large cities:

TABLE 12.—*The practice in certain cities regarding the use of spelling books and prescribed lists of words to be learned.*

Cities.	Methods employed.	Grade in which book is introduced.
New York	Words selected	
Chicago	do	
St. Louis	Book	Third grade.
Cleveland	Prescribed list	
Baltimore	Words selected and book	
Pittsburg	Book	Do.
Detroit	Prescribed list and book	Fifth grade.
Buffalo	Words selected and book	Do.
San Francisco	do	Third grade.
Milwaukee	Prescribed list and book	Fourth grade.
Cincinnati	do	Third grade.

The above table shows that there is considerable diversity among cities regarding the use of a textbook in teaching spelling. Three of the cities use the flash methods through the eight grades—at least through the first and second—after which some text in spelling is employed. From this it appears that a combination of the flash method and the use of a textbook is the most common method employed by the large cities in teaching spelling.

The commission could find no evidence that spelling is neglected in the Baltimore schools. It is probably true that children do not spell as well as their parents, the teachers, the superintendent, or the gen-

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eral public would like. The golden age when everybody could spell correctly is an age which exists purely in the imagination of critics of the schools, who do not realize the efforts that teachers are making in training children to spell and who do not realize the enormous difficulties in acquiring spelling on the part of some children.

Mathematics.

The course of study in mathematics, like the course in the language group, represents the cooperative efforts of the teachers, principals, and the board of superintendents.

Briefly described, the course provides for the introduction of all the fundamental processes with integers within the limits of 18, and the development of the fractions one-half, two-halves, one-third, two-thirds, and three-thirds in the first year. The learning of the 45 combinations in addition is completed in the second year; the multiplication tables are completed and the addition and subtraction of fractions introduced in the third year. Long division, multiplication and division of fractions, and decimals are introduced in the fourth year. Percentage is begun in the sixth year. Mensuration is taught in each grade. Throughout the course emphasis is placed on practical subjects and methods. In the sixth grade and above, teachers are encouraged to use the algebraic equation whenever it will assist in arithmetic.

In the opinion of the commission there is not much to criticize in the course in mathematics in the Baltimore schools. The methods employed are in accord with those used quite generally elsewhere in mathematical study. There is some question, however, in the minds of the commission as to the amount of work in ratio and proportion required in the lower grades. Moreover, there are a few topics in the course of study which might also be questioned. These are the treatment of the fraction two-thirds in the first grade; the measurements of wood and lumber in the sixth grade; partnership in the seventh; life and accident insurance, the volumes of cylinders, and the treatment of drafts in the eighth. But it should be said there is a difference of opinion as to these matters on the part of those whose opinion is of value.

The criticism of the "spiral method" has been insistent in Baltimore.

The method employed in teaching arithmetic depends very largely upon the character of the textbook used. The new edition of the textbooks used in Baltimore is not made on the spiral plan, but the old edition was made somewhat on that plan. From the following quotations from the prefaces and introductions to various texts that are used in the larger cities it will be seen that the textbook writers

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are not thoroughly agreed as to the best method of procedure in introducing topics in arithmetic:

The amount of work that may be accomplished in a half year has been taken as the unit of classification, and within that unit the various subjects have been treated topically, though, of course, not exhaustively. With this order of presentation it is believed that the most satisfactory results may be obtained.

1. These lessons have been prepared in the belief that it is a mistake to assume that one topic is to be finished before another is begun. The elements of many topics are here given in the lower grades in explanations, illustrations, and examples easily understood by the younger pupils, and then the work in each topic is made more and more difficult through the various grades until it is finished. These examples have stood the test of the schoolroom, and in no case have they been found too difficult.

2. The arrangement of the topics is such that pupils on passing into a new grade find but few new topics, and many pupils are prepared for promotion from grade to grade at various times during the year and are not obliged to wait for the annual promotions.

3. Such practical subjects as percentage and interest are introduced in the lower grades where many pupils are found who are obliged to leave school before they reach the more advanced grades.

The following ideas have been prominent in the preparation of this book:

1. In sequence of topics to follow as closely as possible such of the recent courses of study as have been most carefully prepared for our public-school systems. However an author may feel as to details, he is in the main bound by the consensus of opinion as thus expressed. The purely "topical" method is scrappy, uninteresting, and lacking in the continuity so essential to thoroughness. Between these two comes the best type of our modern courses of study, somewhat spiral in arrangement, in that most subjects extend over several terms, but admitting of a topical arrangement within any one term, thus securing thoroughness and maintaining an interest. * * *

2. In the matter of method to recognize the valuable features of the best contributions, avoiding their extremes. For example, there should always be some attention to a spiral arrangement, but its extreme is unscientific and uninteresting. The ratio idea in fractions has much to commend it, but its extreme is unnatural and unbusinesslike. The actual measuring of things is valuable, but that, like paper cutting and folding, may be carried beyond reasonable bounds.

In the distribution of the subject matter care has been taken to combine the best features of the spiral and topical arrangement and to adapt the work at every stage to the growing powers of the pupil. A large quantity of material for drill is provided under each subdivision before a new one is taken up, while carefully graded reviews are continued throughout.

The commission finds its own opinion on the subject of "spiral" teaching voiced in the following extract taken from The Teaching of Primary Arithmetic, by Dr. Henry Suzzallo, of Columbia University:

The courses of study, *which have been most familiar to us in the past decade, have used the "concentric circle" or "spiral" methods of arranging the subtopics of arithmetic.* These arrangements are "psychological" in type. They are attempts to give a systematic order of mastery which shall approximate the child's order of need in knowing. Here the first mathematical facts and skills taught are those the child first requires, regardless as to whether they are first integers or fractions, additions or divisions. A little later, he deals with the same subjects and the same numbers in more complicated manipulation and in more extended application. The field is recovered, as it were, by ever widening circles or by an enlarged swing of the "spiral" progression.

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The older "logical" plans are thorough and definite in their demands; the teacher always knows just what he is about. But such a system of procedure is unnatural and remote from the child; it lacks appeal and motive. The child pursues the subject as a task laid down for him, not as an answer to his own curiosities or necessities. The newer psychological plans meet the different levels of child maturity effectively; they are nearer the natural order of acquiring knowledge. But it is not easy for the teachers to keep account of the work of their own, previous, or subsequent grades. Nor does the supervising official find it easy to locate responsibility for definite arithmetical subtopics. As an order of teaching it is psychologically natural but administratively ineffective.

The result is that, to-day, the two types of arrangement are modifying each other and giving a mixed method, partly "logical" and partly "psychological." That line of least resistance in which the children study arithmetical facts and processes with greatest success is modified by definite demands that topics, e. g., addition, be mastered thoroughly "then and there." The method is partly "topical" and partly "spiral." The child in the second grade may have a little of all the fundamental processes, a few simple fractions, and United States money; but just there he will he held definitely responsible for a very considerable number of the addition combinations. The pupil may have had fractions in every grade, but the fifth grade will be responsible for a thorough and systematic mastery of the same. *Such is the mixed arrangement which is to-day prevalent in American schools.* (The italics are our own.)

This mixed arrangement in the presentation of arithmetical topics is the one which may be said to prevail in the Baltimore schools. If the children are deficient in arithmetical skill, such deficiencies can not be attributed to any particular "method." The cause must in the main be sought elsewhere.

Dr. David Eugene Smith, one of the leading authorities of the country in the teaching of mathematics, says, "There is no 'method' that will lead to easy victory in the teaching of arithmetic. There are a few great principles that may well be taken to heart, but any single narrow plan and any single line of material must be looked upon with suspicion."

The course of study contains the following directions to teachers, which the commission heartily indorses:

A large part of the work in each grade should be oral. In the grammar grades at least one-half should be oral. In the primary grades even a greater proportion will be found needful.

Give special attention to oral arithmetic—mental arithmetic—to the end that facility and accuracy in handling integers and fractions through the fundamental operations are attained.

A large proportion, too, of all review work should be oral. This kind of work should be given systematically. Instead of devoting several weeks solely to reviews to the exclusion of new work, they should precede, accompany, or follow nearly every written exercise. Reviews should not be confined to the work of a particular grade, but should include also all topics previously taught. It should be the aim of each teacher by this means to perfect and augment the work of the previous grades, as well as to discover weak points and strengthen them.

Methods are left to the choice of the teacher, who, it is presupposed, is acquainted with all the approved ways and means and will use the plan best suited to the case in hand.

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It has been frequently asserted that arithmetic is not thoroughly taught in the elementary schools in Baltimore in conformity with established standards of larger cities. The following table shows the time allotted to arithmetic in the various grades in certain cities:

TABLE 13.—*The minutes per week devoted to the study of arithmetic and algebra in certain cities.*

Cities.	Year.								Total.
	First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	
New York	125	150	150	150	150	200	200	200	1,325
Chicago	.....	150	200	250	150	150	150	150	1,200
Philadelphia	150	200	200	200	225	225	225	225	1,650
St. Louis	100	125	150	150	150	150	150	150	1,125
Boston	25	210	210	270	270	230	210	210	1,635
Cleveland	60	200	250	250	250	250	300	300	1,860
Baltimore[1]	250	200	200	200	250	250	275	275	1,900
Pittsburg[2]	60	120	180	200	200	240	300	360	1,600
Detroit	75	150	200	225	250	250	275	275	1,775
San Francisco	150	150	150	200	250	250	250	250	1,650
Milwaukee	75	100	150	175	175	200	200	212	1,287
Cincinnati	150	250	240	240	240	300	300	360	2,080

[1] See page 76. [2] Estimated.

In the table above it will be noted that Baltimore devotes 250 minutes every week to the study of arithmetic in the first grade. This is 100 minutes more than the corresponding allotment in any other city. Baltimore devotes a total of 1,900 minutes a week through the 8 grades. This is the largest total save one. The allotments are suggestive merely of the relative emphasis that various cities place on the different subjects, and inasmuch as the length of the school day will influence the amount of time that can be devoted to any subject, but does not change the percentage of the school time used for the various subjects, percentage is the more reliable guide. In all of the cities under consideration the length of the school year is practically the same.

In order to make comparisons the total time devoted to the study of arithmetic and algebra in the grades in each of the several cities has been changed to percentages and the results shown in the following table:

TABLE 14.—*The percentage of school time exclusive of recesses and opening exercises devoted to the study of arithmetic and algebra in the grades, in 1890 and in 1910–11, in certain cities.*

Cities.	Year.		Cities.	Year.	
	1890	1910–11		1890	1910–11
New York	26.2	13.4	Detroit	17.2	16.0
Chicago	9.3	10.0	Buffalo	.....	.....
Philadelphia	.....	16.1	San Francisco	14.0	16.6
St. Louis	19.3	15.0	Milwaukee	15.5	14.7
Boston	16.6	15.5	Cincinnati	13.4	18.8
Cleveland	14.1	15.5			
Baltimore	19.5	18.3	Average	16.5	15.8
Pittsburg	.....	18.0			

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When the facts for the 10 cities comparable in the above table are sented in tabular and graphic form, we have the following:

TABLE 15.—*Distribution of 10 cities according to the percentage of school time, exclusive of recesses and opening exercises, devoted to arithmetic and algebra in the grades in 1890 and 1910–11.*

Percentages.	Number of cities.	
	1890	1910–11
9–11	1	1
12–14	3	2
15–17	3	5
18–20	2	2
21–23	.....	.....
24–26	1	.....

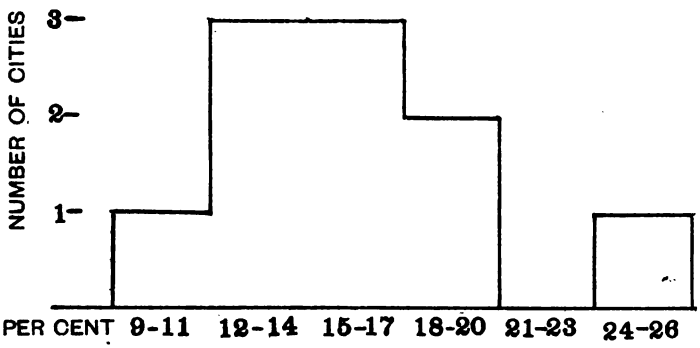

FIG. 10. Graphic representation of the distribution of the percentages of school time devoted to arithmetic in 1910–11 in 10 cities.

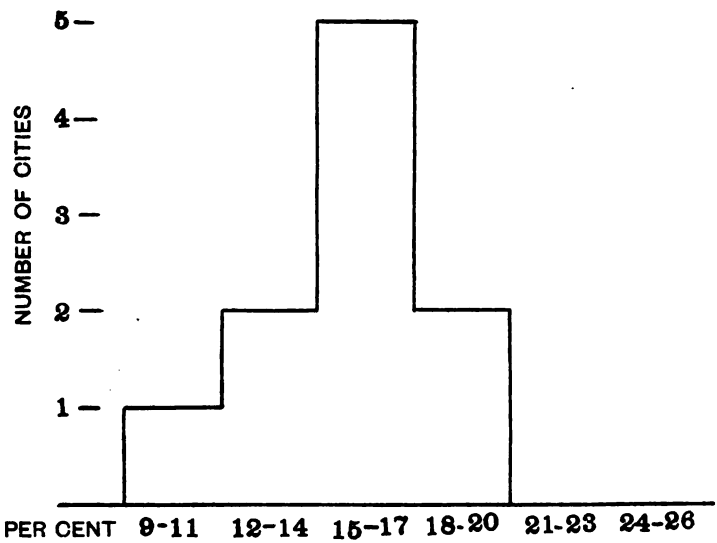

FIG. 11. Graphic representation of the distribution of the percentages of school time devoted to arithmetic in 1890 in 10 cities.

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In 1910–11 the average percentage of school time devoted to the study of arithmetic and algebra in the grades in 12 cities is 15.8. Baltimore devoted 18.3, or 2.5 per cent more time to the study of arithmetic and algebra in the grades than the average in the 12 cities.

In 1890 the average time devoted to the study of arithmetic and algebra in the grades in 10 cities was 16.5. At that time Baltimore was devoting 19.5 per cent of the school time to these studies. This was 3 per cent more than the average for the cities considered. Between 1890 and 1910–11 there has been a decrease of 1.1 per cent in the time devoted to the study of arithmetic and algebra in the 10 cities considered. During the same time there has been a decrease of 1.2 per cent in the time devoted to the study of arithmetic and algebra in the grades in Baltimore.

The following table shows the grade in which certain topics in arithmetic are treated in the various cities:

TABLE 16.—*The year of the course in which specified topics in arithmetic are treated in the certain cities.*

Cities.	45 combinations learned.	Multiplication tables learned.	Long division taught.	Addition and subtraction of fractions taught.	Multiplication and division of fractions taught.	Decimals taught.	Percentage taught.
New York	2	3	3	4	5	5	6
Chicago	2	4	4	5	5	6	6
Philadelphia	2	2	3	5	5	6	6
St. Louis	2	3	4	3	4	4	5
Boston	2	4	4	5	6	5	6
Cleveland	2	4	4	5	6	5	6
Baltimore	2	3	4	3	4	4	6
Pittsburg	2	3	4	4	5	5	6
Detroit	2	3	4	4	5	5	6
Buffalo	2	3	4	5	5	5	6
San Francisco	2	3	4	4	5	4	6
Milwaukee	4	4	4	5	5	6	7
Cincinnati	2	3	3	4	5	4	6

From the above table it appears that the 45 combinations in arithmetic are learned in all but two of the cities in the second grade. The most common grade in which the multiplication tables are learned is the third. Long division is taught most commonly in the fourth grade; addition and subtraction, multiplication and division of fractions, and decimals are most commonly taught in the fifth grade; and percentage in the sixth. This would indicate that Baltimore deals with fractions and decimals earlier than the normal for the 13 cities considered.

More specifically it has been charged that too much work in fractions is introduced in the earlier grades. The following table shows the time of completion of the 45 combinations in addition and subtraction, the number of multiplication tables, and the fractions having for the numerator 1 and denominator 2, 3, 4, 5, etc., learned in the first two years:

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TABLE 17.—*The grade in which the learning of the 45 combinations in addition and subtraction is completed, the number of multiplication tables learned and the fractions having for numerators 1 and denominators 2, 3, 4, etc., learned in each city during the first two years, and the cities and grades in which algebra is taught.*

Cities.	Completion of the 45 combinations.	Work completed in first and second years.		When algebra is first taught.
		Multiplication tables.	Fractions, numerator 1.	
New York	Second grade	5 x 9	$\frac{1}{2}$–$\frac{1}{8}$	7 A.
Chicago	do	3 x 12	$\frac{1}{2}$–$\frac{1}{3}$	None.
Philadelphia	do	9 x 10	None.	8 A.
St. Louis		5 x 10	$\frac{1}{2}$–$\frac{1}{8}$	None.
Boston	Second grade	(1)	(1)	None.
Cleveland	do	(2)	None.	8 A.
Baltimore	do	5 x 10	$\frac{1}{2}$–$\frac{1}{8}$	None.
Pittsburg	do	4 x 10	$\frac{1}{2}$–$\frac{1}{4}$	7 A.
Detroit	do	None.	None.	None.
Buffalo	do	5 x 10	$\frac{1}{2}$–$\frac{1}{8}$	None.
San Francisco	do	4 x 9	None.	None.
Milwaukee	Fourth grade	3 x 10	$\frac{1}{2}$–$\frac{1}{3}$	None.
Cincinnati	Second grade	None.	None.	8 B.

[1] No definite data at hand. [2] Not formal.

From the above table it appears that other cities are doing as much in arithmetic in the first two years as is outlined for Baltimore. Buffalo, for example, has the same limits as Baltimore. St. Louis does not complete the 45 combinations in the second grade, but it has the multiplication tables to the fives and develops the fractions from one-half to one-eighth. The work outlined in fractions is not more than is given in other cities. Many of the teachers, however, have criticized the work in fractions and have asserted that they were required to teach relations with involved mixed numbers, such as $21=1\frac{1}{2} \times 14$. The commission has found that in many schools this work is done in the second grade; in others it is not done. Such work is not outlined in the course of study, but under date of November 13, 1908, the board of superintendents furnished answers to questions submitted by teachers in the second grade on interpretation of the course of study in mathematics. This answer contains the following statement:

B CLASS—TOPIC 1.

(1) For the proper development of each series it is necessary that all the relations in the series be taught.

Example—

In the series 8, 16, 24, 32 the number 8 should be taught as equal to one-half of 16, one-third of 24, and one-fourth of 32.

The number 16 should be taught as equal to two times 8, two-thirds of 24, and one-half of 32.

The number 24 should be taught as equal to three times 8, one and one-half times 16, and three-fourths of 32.

The number 32 should be taught as equal to four times 8, two times 16, and one and one-third times 24.

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Besides these fractional relations, the teaching of the combinations and separations of the four numbers within each series is also necessary.

Example—

Add.			Subtract.				
8	8	8	32	24	16	32	32
8	16	24	8	8	8	24	16
16	24	32	24	16	8	8	16

To present these relations properly, it is necessary that concrete material—solids, rectangles, lines, etc.—showing these relations be used.

It is further necessary that an application of these relations to the child's everyday experience be made through problems in denominate numbers.

And, finally, tests are necessary, both at the close of each lesson and of each series of lessons, upon these relations without illustrative material.

A similar interpretation had been sent out by one of the supervisors of practice teaching.

Complaints have been received regarding the omission of algebra and geometry from the course of study. Formerly both of these subjects had a distinct place in the curriculum; at present the course of study provides that algebra may be taught incidentally.

Such problems in the arithmetic as lend themselves usefully to such treatment should be solved by means of algebraic equations. The teaching of the processes involved should be done without the use of textbooks, by development exercises, when the occasion for their use arises, not by formal instruction given beforehand at special periods. Carry on the work in connection with that in arithmetic, so that each subject is made to illustrate and supplement the other, and a better understanding of both subjects is secured. In this way pupils will not only acquire an intelligent understanding of the general method of solving problems, but also the correct idea at first hand of equations and their use, clearing them of fractions, transposing a term from one member to another, something of the fundamental operations; and of fractions, the greatest common divisor, the least common multiple, factoring, and of the meaning and use of algebraic language and processes.

No special amount of algebra is required. It is left to the teacher to do what she finds herself able to do so as to improve the teaching of arithmetic.

The commission has not found that algebra is taught to any extent in the elementary schools. Geometry is not required as a distinct subject. In Baltimore, as in all the other cities, the work in mensuration includes much of the computations formerly required in geometry. In no one of the 13 cities is geometry now given as a distinct subject, and in only 5 of these cities has algebra a distinct place in the curriculum.

Geography.

The course of study provides for the study of geography from the third to the eighth grades, inclusive. "Beginning with the study of the home environment, it gradually introduces the study of our own country, then of far-away countries and their people, and closes with a year's work upon the general principles of physical and commercial geography."

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When the Baltimore course of study in geography is compared with the courses for other cities, no significant differences appear. The general movement in all the courses is from the home and its environment to the earth as a whole, and from this to North America and a detailed study of the United States. After this, the foreign countries are studied and the work ends in the upper grades with a more or less definite study of world relations.

The Baltimore course emphasizes the study of home or local geography to a degree found in few courses elsewhere. "Recognition is made of the fact that for Baltimore children the most important city is Baltimore, the most important State is Maryland, the most important country is the United States. This point of view accounts for the length of time devoted to these areas."

The following statement from the course of study is not novel to those who have observed the trend of late years in geography teaching. It is quoted to show that the Baltimore course recognizes the prevailing tendencies in the teaching of the subject:

> Emphasis is laid upon the use of excursions and pictures, especially through the earlier grades, because, through their use, accurate ideas are gained and greater interest is aroused. Actual experiences, knowledge of home conditions, and contact with things near at hand furnish the only known means of interpreting conditions elsewhere. At the same time the warmth of feeling and stimulus to action aroused in one's own locality help to stir the imagination and to develop social sympathy toward people whom we can not know personally.

The treatment throughout the course is largely by topics and the facts are organized about important centers of interest. The commission believes that there is little in the course of study in geography which is open to valid criticism. Indeed, it is of the opinion that it is one of the most logical courses of study to be found in the subject. Teachers are not required to teach all of the topics presented, but may choose from the topics. The liberty that is granted the Baltimore teachers in this respect is presented elsewhere in the report of the commission. As bearing upon this, however, it is well to quote from the course of study:

> Topics are marked short, medium, and long, to indicate the judgment of the committee as to the relative amount of time to be spent upon each, but there are no absolute standards; teachers need to use their own judgment in determining the number of lessons to be given to any topic. As indicated in the course of study, a short topic may be completed in from one to three lessons, a medium topic in from three to seven lessons, a long topic in from seven to ten lessons.

It is true that the course makes large demands upon the scholarship and resources of teachers. Indeed the commission has received several anonymous criticisms from teachers, concerning the course of study in geography. The particular point of these criticisms has been the necessity of treating subjects which are not contained in the textbook. The statement is made that this method of instruc-

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tion imposes a disproportionate amount of labor upon the teachers compared with the results to be obtained.

It should be remembered that efficient teaching of geography in Baltimore or elsewhere is by no means the simplest or easiest of the teacher's tasks. In a recent report of the Massachusetts Board of Education are the following statements:

> It is hard to realize the immense distance that separates the scanty sailor geography of half a century ago from the complicated network of relations of physical and social and political facts, gathered in 50 years of untiring research, which now, under the name of geography, form a part of the daily food of all children in the elementary schools.
>
> A qualified teacher of geography in a grammar school must possess intellectual power of a high order—a comprehensive grasp of details and ability to master extended trains of inductive reasoning. There is no subject in the high school curriculum which makes severer demands on the teacher considered simply as a scholar.

Bearing upon the question of procedure elsewhere, the following quotations from courses of study are made; these are typical of other courses throughout the country:

> In the study of geography, it is important to use not only the basal text but also supplementary material, such as maps, graphs, pictures, globes, and supplementary readers. (Chicago Public Schools, Course of Study, p. 23.)
>
> Geography, in the grades where the study of history has not been taken up, furnishes the best means available for arousing a wide-awake interest, and cultivating the child's power of research and his independent judgment. The textbook is useful chiefly as a book of reference, and as a source of information which the child is to find and arrange for himself. Other geographies, both recent and ancient, encyclopedias, books of travel, pamphlets of information issued by railway and steamship companies, bird's-eye views, current magazines and periodicals—all may be laid under contribution, and are especially valuable in the study of commercial geography. (Milwaukee Public Schools, Course of Study, 1909, p. 118.)
>
> The greater part of the work in geography should be done in the presence of the teacher in the classroom. It seems useless to assign daily lessons to be prepared at home. * * * The text of any section of the subject to be read aloud—first as a reading lesson, that a general idea may be obtained; then a specific study from the open textbook—pupils answering exactly and concisely the definite questions of the teacher. Selections from a supplementary reader or geography introduced just where the specific subject matter is closely related. (Pittsburg Public Schools, Syllabus, 1910, p. 119.)

While the commission indorses the plan of the course of study, yet it believes that in working it out in school-room practice so large an amount of oral and blackboard work is required of teachers as to make very large demands upon their time and strength. This is necessary in order to present the material to pupils. The Baltimore course of study in geography should not, in the opinion of the commission, be essentially modified, but a larger number of books should be supplied for the use of pupils, to the end that they may more readily obtain at first hand the information and facts for which the course of study calls. Pupils would

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also by this means be somewhat relieved from keeping notebooks, which is desirable. In some intermediate grades, children keep several notebooks, as many as five in certain schools. The notes that are kept in these books consist very generally of rather elaborate outlines of subjects. Too often teachers neglect to consistently examine these books.

The suggested allotment of time for the study of geography in the Baltimore schools is 11 per cent of the total school time, exclusive of opening exercises and recesses. The following table shows the suggested time allotment for the study of geography in the various cities in 1890 and again in 1910–11:

TABLE 18.—*The percentage of the school time, exclusive of opening exercises and recesses, devoted to the study of geography in various cities in 1890 and in 1910–11.*

Cities.	1890	1910–11	Cities.	1890	1910–11
New York	2.7	6.2	Detroit	8.6	8.2
Chicago	4.9	4.4	Buffalo	(1)	.....
Philadelphia	.....	7.0	San Francisco	8.9	7.5
St. Louis	8.9	7.3	Milwaukee	6.9	6.7
Boston	6.8	6.2	Cincinnati	6.5	6.1
Cleveland	6.9	7.2			
Baltimore	6.3	11.0	Average	6.55	7.23
Pittsburg	.....	9.0			

[1] No data at hand.

When the facts concerning the 10 cities whose time allotments are given for both 1890 and 1910–11 are shown in tabular and graphic form, we have the following:

TABLE 19.—*Distribution of percentages of school time, exclusive of opening exercises and recesses, devoted to the study of geography in 10 cities in 1890 and the corresponding allotments in 1910–11.*

Percentages.	Number of cities.	
	1890	1910–11
3	1	.....
4	.....	1
5	1	.....
6	3	3
7	2	4
8	1	1
9	2	.....
10	.....	.....
11	.....	1

The above tables show that Baltimore is devoting a larger percentage of the school time to the study of geography than is given by any other city. The average for the 12 cities reporting in 1910–11 is 7.23 per cent. This is 3.77 per cent less than Baltimore's allotment. In 1890, Baltimore devoted 6.3 per cent of the school time to the study of geography. This is 4.7 per cent less than is now devoted to this

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subject. A comparison shows that the most characteristic percentage of time devoted to geography in 1890 was between 6 and 7, while in 1910–11 it was between 7 and 8. Thus, while the tendency has been to increase the amount of time devoted to the study, Baltimore has probably erred in giving so large a percentage of the school time to this subject.

Nature study.

The Baltimore course of study provides for nature study in each of the grades. It suggests many more topics than any of the teachers is expected to take up. The work is correlated with language, physiology, and geography, and in the upper grades the course takes on much of the nature of elementary science. Experiments that are the outgrowths of work in geography and physiology, as well as nature study, are introduced. The course is in line with modern tendencies in the teaching of the subject.

The time allotted to this study varies from 60 minutes to 100 minutes per week, depending upon the grade. The total time devoted to this work throughout the eight grades is 4.5 per cent of the total school time, exclusive of opening exercises and recesses.

The tendency among cities, Baltimore included, to correlate nature study with English, geography, and physiology makes it impossible to present definite comparisons between the course suggested for Baltimore and those suggested by other cities. In each city much more work is outlined than any teacher is expected to do, and a great deal is trusted to the discretion of the teacher. Each course emphasizes the necessity for dealing with objects rather than with the literature concerned with the subject. To this end several cities make use of the school garden. Each course aims to make the work in nature study serve as a basis for oral and even written composition.

The object of introducing this study in all of the cities is to cultivate the habit of observation and to impart a body of useful information. In all of these particulars the course suggested for Baltimore is entirely in keeping with the courses suggested by other cities.

The fact that there is a tendency among the cities to give no separate time allotment to this subject, but rather to include it in the time devoted to other subjects, makes it impossible to compare the time allotment in Baltimore with that of other cities. A reading of the conditions under which the work is given in those cities indicates that the time devoted to this subject in Baltimore does not vary greatly from the time devoted to it in other cities.

The fact that the Baltimore nature-study outline is mentioned in the Cleveland outline for work in nature study indicates the estimate that at least one superintendent places upon this course.

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History.

The course of study in history provides for the teaching of United States history in the fourth, fifth, sixth, seventh, and eighth grades. This is in general accord with the subject material of history in many of the progressive school systems of the country.

Parallel with the history of the United States, as set forth above, are the history stories relating to other countries, taught in the fourth and fifth grades. The subject material of these stories has been carefully selected and is much the same in its general character as that which is found in courses of study elsewhere.

In the sixth, seventh, and eighth grades, a series of exercises, based upon important phases of European history, is presented. These exercises have in the main been selected with reference to their relation to the periods of United States history which the pupils are at the time studying. For example: The subject chosen for the periods of the Revolutionary War in the United States is the Revolution in England and the Revolution in France. There is much to be said in favor of presenting to pupils an outline of important phases of European history, particularly those parts of it which have a bearing upon United States history. There is an increasing conviction among historical scholars that the history of the United States should not be taught apart from those phases of European history which have affected our own history.

In the Baltimore course of study is an application of this theory, and the course is in accord with plans in operation in some other cities.

The commission feels that it is questionable whether, with the limited time at the disposal of teachers, with the meager scholarship of some teachers, and with the large number of activities which have been forced upon the schools by outside public demands, it is advisable to attempt so much in the way of European history as the Baltimore course at present provides. It is not wholly a question of the value of such instruction, nor is it a question as to whether children are interested in it, but it is also a matter of deciding which is the best possible use of the children's time.

The commission is not to be understood, however, as being opposed to the correlation of United States history with European history; it is only a question of the extent of this correlation which the commission raises.

The members of the commission saw some excellent work in history instruction in the Baltimore schools. The commission was particularly impressed with the attention which is given to local, or Maryland, history. The teaching of this local history was in evidence in many schools which the commission visited, and it has only words

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of commendation for this phase of the instruction. Local history is too much neglected in many schools. The commission feels that this is not true in Baltimore.

In a number of schools, the commission was impressed with the fact that the schools are deficient in the supply of necessary reference books, which the present course of study demands. A good working library of historical books should be available in every large building.

Drawing.

The Baltimore course of study in drawing shows a definite plan. There can be no confusion on the part of teachers regarding the work desired by the art department. There seems to be little provision, however, for the study of art industries and little thought for interrelation with other subjects of the school curriculum. In these respects the course in drawing might be made stronger and more in line with the present tendency to relate art to industrial training.

Physiology and Hygiene.

The course of study provides that one period a week shall be given to the teaching of physiology and hygiene in all grades. An examination of the directions to teachers in this subject shows that the exercises suggested are in line with the present-day tendencies of teaching the subject. There is an increasing feeling that this subject should be closely allied to the demands of modern life; particularly is this true in courses of study for city children who live in congested districts.

In the following extract is found a statement of the tendencies in the treatment of the subject:

> When the pupil is old enough to make a formal study of any branch of hygiene, he should be taught with the same direct appeal to sense experience that we insist upon in other branches of science, and only those portions of the study should be selected which are capable of practical treatment, followed by some immediate personal application.

As an evidence that the Baltimore course is in line with this tendency, we quote from the directions in the course of study:

> In connection with physical culture attention is to be called to the value of a good erect carriage, well-developed chests and lungs, and an active blood circulation. Children's hands and other visible parts of the body are to be daily examined. If this is done in the first three grades the habit of cleanliness will generally have been effectively established by the time the children enter the grammar grades.
>
> Whenever an occasion is offered, reasons are to be given for temperance in eating and drinking, working and playing, sleeping and waking.
>
> Care of the eyes, teeth, nasal and vocal organs should be urged as frequently as possible, not at stated intervals, but in connection with other subjects.

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As an example, the entire series of exercises given in the fifth grade is as follows:

TOPICS FOR FIFTH GRADE B.

1. Review fourth grade A topics.
2. The muscles of the body.
3. Exercise of the muscles.
4. The skin.
5. Hygiene of the skin.
6. The public health.
7. Hygiene of the home.
8. Self-government.

TOPICS FOR FIFTH GRADE A.

1. The brain.
2. The brain's messengers.
3. Care of the eyes.
4. Care of the voice.
5. Contagious diseases.
6. The public health.
7. The hygiene of the home.
8. Hints for help in emergencies.
9. Uses and abuses of household medicines.
10. Self-government.
11. Health rules.

The commission commends the provision that has already been made for physical education. This instruction, however, should be extended and improved. As a result of their school life, the health of children should not only be safeguarded but should be improved. This is particularly true when hundreds of children live in congested districts, as is the case in Baltimore.

Positive instruction in physiology and hygiene is not enough. Gymnastic exercises are necessary. Teaching young children to play is also important. Strange as it may seem, many children do not know how to play, such are their home conditions. The schools should alleviate, so far as possible, this misfortune. Play is not only connected with the health, but with educational progress in other directions. One gets the impression that there is not enough of this play element in the Baltimore schools. The teacher of 6-year-old children who said to a member of the commission, "These children do not need games; they need drill," reflects the attitude of too many teachers of primary children. To be sure, they need drill; but progress in reading, number work, and penmanship is often more rapid if a variety of physical exercises are found in the schools. This fact, stated here somewhat dogmatically, has been proved over and over again in many schools.

In the opinion of the commission an increased amount of sympathetic constructive supervision and leadership in the physical-training department would remedy whatever defects are found in the department.

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The schoolhouse conditions under which children do their work is another important consideration bearing vitally upon their health. The ventilation, the lighting, the heating, the seating, the cleanliness, the toilet arrangements, the playground areas, all these can not be ignored in any discussion of the influences which affect the health of school children. As pointed out elsewhere in this report, these conditions in many schools in Baltimore are not altogether creditable.

Handwork and Industrial Subjects.

(1) The Baltimore course of study provides for manual training throughout the grades. In the first five years of the elementary school course boys and girls may be instructed together in the regular classrooms. This instruction continues through the sixth year also, unless the school is located in a building having a manual-training center. The materials used in this work consist of cardboard, raffia, etc., and the tools are scissors, rulers, etc.

Manual training in the grades above the sixth is carried on in manual-training centers in certain schools. In these centers rooms are equipped for this work and classes pass here for half of the forenoon or an entire afternoon once a week. In these centers models from wood are made and various forms of joints are taught. The sixth grade in the buildings in which these centers are located begin this work. Work of this same character, though not confined to woodwork, is conducted in the various classes for backward children.

(2) Girls in the third to the sixth grade, inclusive, and also in the eighth grade, are taught sewing. In many of the schools a special room is set aside for this work, and here the special teacher meets the classes. Fifty-five minutes a week are devoted to this work.

(3) Cooking centers are maintained at various school buildings in the same manner in which manual-training centers are maintained. Girls from the seventh grade are here taught for a whole afternoon or half of a forenoon during one day of the week. Sixth-grade girls in the buildings in which the cooking centers are located are also given this work.

(4) In one school for white children and in one for colored children special emphasis is being placed upon the industrial work. The amount of time devoted to this work is about 8 per cent of the total school time. It is the declared purpose of the board to increase the number of these schools as rapidly as accommodations can be supplied.

Approximately one hour a day is devoted to manual training from the first to the sixth grade, inclusive. In the seventh and eighth grades the suggested time allotment is 110 minutes per week; this is therefore 5.3 per cent of the total school time, exclusive of opening exercises and recesses.

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The following table shows the percentage of time devoted to manual training in certain cities in 1910–11:

City.	Percentage.	City.	Percentage.
New York	4.7	Pittsburg	5
Chicago	9.9	Detroit	1.4
Philadelphia	3.5	Buffalo	(1)
St. Louis	2.4	San Francisco	1.8
Boston	6.2	Milwaukee	6.2
Cleveland	4.8	Cincinnati	2.2
Baltimore	5.3		

[1] No data at hand.

The commission is of the opinion that the extension of industrial training, particularly along vocational lines, is desirable. Baltimore is a large manufacturing city. It may be found practicable in the near future to relate the work of the schools to the numerous vocational opportunities the city affords for the employment of young people.

CONDUCT OF INSTRUCTION.

The commission believes that in many respects the teachers of Baltimore are granted unusual freedom in their work. They are certainly given more latitude than is found in some other important cities. As illustrative of this fact, the following instructions issued from the superintendent's office are offered as evidence:

RELATIVE TO COURSE OF STUDY.

The course of study is a guide to the selection and sequence of material rather than a prescription of the amount of work to be done. Some classes will do more than other classes working with the same course, and some individuals in each class will accomplish more than other individuals. When the teacher and principal are satisfied that work is too easy for any pupil, that pupil should be advanced by special promotion. The fitness of pupils for promotion should not be measured entirely by what they know, but largely by what they can do with new lessons.

From now to the end of the year teachers who find their classes weak in a particular subject should give more periods to such subjects than to those in which the pupils are strong—not longer periods, but more periods. In fact, this may be done at any time of year, always, of course, with your approval in each individual case. The arrangement of time and subjects on schedules sent out from this office is, as you know, suggestive only.

RELATIVE TO DAILY SCHEDULES AND LESSON PLANS.

The teachers into whose hands this pamphlet goes are to understand distinctly that with the exception of the section headed "General directions," it offers merely suggestions for making daily schedules and lesson plans. With regard to such plans it would be most undesirable for teachers to feel that they are receiving instructions which must be followed absolutely. The plans here given may be found serviceable as models upon which varying schedules and plans may be patterned.

It would be an exceedingly unfortunate thing if every teacher in the public schools felt obliged to use the schedule for his grade or the plan for his work to be found in

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this book, excluding any of his own making. He should study his particular conditions, and if convinced that the suggestions here offered are the best for his class he should use them; otherwise these outlines should be freely modified.

RELATIVE TO SECTIONAL TEACHING.

Teachers not accustomed to divided-class management will, if they so request, be permitted at first to limit sectioning to two subjects. Later, however, they will be expected to extend the plan to other subjects. Any help needed, either in inaugurating or carrying out the section plan of teaching, is to be obtained from the group principal.

RELATIVE TO TIME ALLOTMENT OF RECITATIONS.

Except in the few instances noted in succeeding pages, or for extraordinary reasons, the following time limits are not to be exceeded: Grade one, 15 minutes; grades two, three, and four, 20 minutes; grades five and six, 25 minutes; and grades seven and eight, 30 minutes. Painting, drawing, or construction may require 30 minutes in grades one to six. In order to give the teacher needed help, the supervisor may at times have to prolong an illustrative exercise somewhat beyond the time limits.

TEACHING METHOD.

The children feel too little responsibility; the teacher and the textbook are too much in evidence, and the progressive activities of the children too little in evidence. In some primary schools there is not enough recognition of child life, either in methods of teaching or in variety of exercises. The teaching is not adapted to children, for the point of view is too often that of the teacher rather than that of the child. The children take little part in recitations other than answering formal questions. The initiative is that of the teacher rather than that of the pupil. For example, in some schools, pupils are required in their exercises in oral English to reproduce stories that have been told them in exactly the way that they were told, and therefore no chance given a variation in the telling. The judgment is too rarely exercised, because the ideal is to memorize the facts rather than to draw inferences from the facts.

Not enough use is made of the principle of apperception. Lessons are begun with very little attention at bringing up the lessons that have gone before, and are ended without leaving any very definite impression on the child's mind as to just the purpose the lesson was to serve. The impression is that of a disjointed type of work.

SECTIONAL TEACHING.

The commission has received many criticisms of sectional teaching. The following quotation from the Twelfth Annual Report of the City Superintendent of Schools to the Board of Education of the city of New York (pp. 260–262) states the arguments presented both for and against sectional teaching.

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INDIVIDUAL INSTRUCTION AND GROUP TEACHING.

One of the most serious criticisms that is made of modern education, especially in cities where the attendance is large and the classes are closely graded, is the tendency to recognize large groups of pupils rather than individuals. Mass teaching is in the line of least resistance; and as a consequence many a teacher centers her attention but little on individuals; she measures her success by the progress of the class rather than of individual members.

The object of school classification is to place pupils in right relation to work and to each other, and to facilitate progress through the grades. Differences are sure to exist in any class, in the ages and maturity of pupils, in their ability and progress, in their regularity of attendance and power of application, and in the assistance rendered at home; and these differences should be recognized. Any plan of grading pupils has a tendency to hold in check the bright pupils and thus to deaden rather than to quicken mental activity; and on the other hand, ordinary school classification may discourage the slow and backward pupils who fail to grasp clearly much of what is presented.

SINGLE DIVISION.

The main arguments advanced in favor of a single division in class work are: Fewer classes, and, therefore, more time for each exercise, and presumably more thorough work; accelerating effect of mass movement upon certain pupils; difficulty in keeping the division not reciting profitably employed; and less work for the teacher. These arguments, however, have small weight in the mind of a genuine teacher thoroughly interested in the progress and best work of her pupils.

TWO DIVISIONS.

The main arguments in favor of at least two divisions in the main subjects in a class are:

1. A small group of pupils can be kept interested, attentive, and mentally alert better than can a class of forty or fifty pupils. In other words, any teacher will hold the interest and enthusiastic attention of one-half or one-third of a large class better than she can of the entire class, and she can do more and better work in fifteen or twenty minutes with the individuals in a small group than she can in twice the time with the individuals in a large class.

2. A definite time for study and self-directed effort is afforded. In mass teaching there is a tendency to make the recitation too prominent, and to undervalue the worth of study. This fact is clearly apparent when pupils leave the elementary grades and are obliged to prepare their lessons without a teacher's assistance. Those pupils who were taught the art of individual and persistent application to study in the elementary grades have a great advantage in the secondary schools over those less favored.

3. The power of concentration and inhibition is strengthened by group teaching. Pupils who are in a recitation the greater part of the day are apt to grow intellectually weak; they absorb without effort whatever is given them; they find it difficult, if not impossible, to apply themselves with vigor to the preparation of their lessons without the constant oversight and assistance of teachers. The reason for their helplessness in the higher grades is due largely to the fact that pupils have not been taught in the elementary grades to apply themselves to the mastery of books, to work independently and energetically even while other exercises are being carried on in the room.

4. There is less opportunity for the teacher to talk and to explain in short periods when the class is in two divisions than in long periods with a single division. And a point well worth consideration in connection with group teaching is the fact that

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the teacher's questions and explanations must be given in a quiet voice, lest she disturb the division which is preparing a lesson. This one point alone is ground enough for requiring group teaching in every elementary school.

5. There will be more attention to the individual child and more opportunity for wise assistance and for the promotion of deserving pupils in a small group than in a large one. Small groups encourage personal attention; large groups discourage it. The plea, therefore, for two divisions in the main subjects in any elementary class resolves itself into a plea for greater care and oversight of the individual pupil. The special plans for classifying and promoting pupils that have been exploited by superintendents in various cities during the past few years have as their basis the special needs of the individual child.

The statements made in the quotation above will, in the judgment of the commission, apply with equal force to the conditions in Baltimore. The commission approves the plan of sectional teaching set forth in the following quotation from "General directions" in the supplement to the outline of studies for the elementary schools of Baltimore (p. 5):

Arrange the program in every grade so that the children shall be engaged in independent work (such as study or constructive exercises) for one-fourth to one-half of each day. Since opportunity for self-direction is an essential toward cultivating self-reliance and resourcefulness, these exercises should not be under the immediate guidance of the teacher.

To provide for this highly important part of school education, divide the class according to working ability into two or more sections and teach them separately in a manner similar to that indicated in the accompanying schedules. Music, penmanship, written spelling, drawing, and physical culture are appropriate subjects for undivided-class exercises.

The ideal arrangement for divided-class teaching applicable especially to grammar grades would provide for new sections according to the daily or weekly progress of individual pupils in separate studies, and would involve no change of schedule. Before one can arrange a plan so flexible as this, the two or three section schedule must first become familiar.

(For further explanation of flexible sectional management, see Baltimore School Report for 1902, pp. 23–25, and Report of the Commissioner of Education, 1898–99, Vol. I, pp. 341–344.)

COEDUCATION OF THE SEXES.

The subject of coeducation of boys and girls has not, so far as we can learn, aroused such serious question in other cities as has recently been raised in Baltimore. The preponderance of American opinion seems to be very markedly on the side of coeducation in both primary and grammar schools. In the absence of any well-ascertained information which would show plainly that coeducation in these grades presents fewer advantages and greater evils than separate education, we can not advise the transformation of the mixed schools into schools in which the sexes are separated. Public schools of both types exist in Baltimore to-day. Considerable expense would undoubtedly be involved in the attempt to reduce all of these to the one type of the school in which boys and girls are separated, and such expenditure

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must inevitably delay improvement in other directions where the need of change is more manifest.

The following table shows the practice in regard to coeducation of the sexes in 15 of the larger cities:

Coeducation in 15 cities of 300,000 population and over.

[Based on information received from superintendents of schools.]

Cities.	Percentage of elementary classes containing both boys and girls.	Extent of opposition by public.
New York	Both attend grades below the fifth in most schools. In many buildings boys and girls are separated at the beginning of the fifth year.	Opinions vary with different sections of the city.
Philadelphia	About 93 per cent	No noticeable objection.
St. Louis, Mo	All	No opposition as far as known.
Boston, Mass	80 or 90 per cent	No serious objection.
Cleveland, Ohio	All	No opposition.
Pittsburg, Pa	do	
Detroit, Mich	do	No general opposition.
San Francisco, Cal	More than 90 per cent	No opposition.
Buffalo, N. Y	About 50 per cent	Do.
Milwaukee, Wis	All	Practically no opposition.
Cincinnati, Ohio	Nearly all	No opposition.
Newark, N. J	All	Do.
New Orleans, La	About 60 per cent	Little opposition for primary grades.
Washington, D. C	All	No objection.
Los Angeles, Cal	Practically all	Do.

HOME STUDY.

The commission has heard complaints about the amount of home study required. The directions concerning home study are as follows:

To aid in establishing habits of industry and self-reliance, home work, involving activities of construction, may be assigned to third and fourth grades (something to do with the hands rather than something to study). Home assignments in the fifth and sixth grades should be partly of this character. (School Hygiene, Shaw.) In general, home study should be supplementary to classroom work, and should deal with matters treated in a previous lesson.

These directions, which limit the home work in the third and fourth grades to hand work, are excellent. As to the higher grades, more definite directions might well be given. In the lower grades, the limitations of home study, as stated, should be enforced.

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CHAPTER IV.

SUBSIDIARY TOPICS.

THE SCHOOL PLANT.

The commission deems it its duty to call attention to the condition of many of the schoolhouses.

While the commission was gratified to observe that new schoolhouses had recently been erected in Baltimore which are a credit to the city, yet it must record the fact that a large number of the present school buildings are not suitable for school purposes. In many of the older buildings the rooms are without any ventilation other than that which comes from windows, and the lighting is very poor. We believe the eyesight of children must be impaired by the inadequate lighting of many school buildings. We understand that upward of 200 rooms are still heated with stoves. The commission observed some rooms which are only 20 by 21 feet in size. In many schools there is no adequate provision for the outside wraps of the school children. Moreover, many of the schoolhouses are untidy and the janitor service inefficient. These are not pleasant facts to state, but the commission would be derelict in its duty if it failed to record its views on this subject.

The commission believes, too, that in some buildings of three stories in height, which have been erected in comparatively recent years and are not of fireproof construction, there is a danger, more real than imaginary, of fire and the possible sacrifice of the lives of children.

The commission is aware of the fact that the school board has called the attention of the municipal authorities to the condition of the school buildings and that it has asked for a large bond issue for new schoolhouses. The commission does not see how the municipal authorities can fail to take prompt action for the correction of these evils.

THE ATTENDANCE OF PUPILS.

The table on the following page shows for the years 1870, 1880, 1890, 1900, and for each year thereafter the principal items of attendance statistics. The figures are based on the reports of the board of school commissioners.

These figures indicate a normal increase in the enrollment from 1870 to 1900, unusual fluctuations in the two following years, and a gradual diminution from 1903 to the present. It is difficult to treat satisfactorily statistics relating to enrollment over a period of years because of the general lack in most cities of the observance of the rule requiring that no duplication be allowed. It seems that this rule was not put into effectual practice in Baltimore until 1905. It

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is likely, therefore, that the exceptional figures for 1901 and 1902 can be accounted for on this basis.

Years.	Enrollment, all schools.	Average daily attendance, all schools.	Number of pupils belonging, all schools, Dec. 31.	Enrollment, elementary schools.
1870	34,769	19,277	23,898	33,615
1880	51,117	29,417	35,297	49,071
1890	65,758	41,603	50,899	63,499
1900	79,659	54,403	64,720	77,198
1901	[1] 83,415	52,640	64,918	80,376
1902	[1] 88,523	51,776	66,399	85,157
1903	82,297	55,353	67,368	78,465
1904	81,582	55,156	68,093	77,143
1905	81,205	55,067	67,964	77,830
1906	81,964	55,079	69,446	78,477
1907	81,402	54,572	68,723	77,816
1908	80,235	55,501	68,924	76,446
1909	80,363	55,011	68,120	76,045
1910	79,838	55,103	67,508	75,366

[1] The report for 1901 "after deductions for transfers have been made." The enrollment for 1902 probably contains duplications on account of transfers.

While an increased rigidity in the enforcement of the rule may have had some effect in causing a continued slight decrease in the enrollment after 1905, it seems more probable that there has been a slight falling off in the actual enrollment during the past five years. The average daily attendance statistics for the past six years shows very little variation from year to year, notwithstanding the probable decrease in enrollment. It is difficult for the same reason to speak satisfactorily concerning the enrollment in proportion to population from decade to decade. The following table, taken from the reports of the Commissioner of Education, shows the proportions:

Years.	Enrollment, all schools.	Population.	Ratio.
1880	48,066	332,190	14.5
1890	63,545	434,439	14.6
1900	79,684	508,957	15.6
1910	79,838	558,485	14.3

The following table, showing the ratio of enrollment to population in 1910 of all cities above 350,000, speaks very favorably for the total enrollment in Baltimore. Only Buffalo, New York, and Boston show a higher proportion of their population in the public schools.

Cities.	Population.	Enrollment.	Per cent.
New York	4,766,883	744,148	15.6
Chicago	2,185,283	301,172	13.8
Philadelphia	1,549,008	174,441	11.3
St. Louis	687,029	87,931	12.8
Boston	670,585	111,632	16.6
Cleveland	560,663	74,438	13.3
Baltimore	558,485	79,838	14.3
Pittsburg	533,905	57,215	10.7
Detroit	465,766	57,996	12.5
Buffalo	423,715	62,695	14.8
San Francisco	416,912	43,155	10.4
Milwaukee	373,857	42,372	11.4
Cincinnati	364,463	47,454	13.1

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Baltimore ranks lowest as regards the average number of days attended by each child enrolled, its average being 10 days lower than that of the next city and 42 days lower than that of Milwaukee.

TABLE 20.—*Average number of days attended by each child enrolled, 1910.*

Cities.	Aggregate attendance, in days.	Total enrollment.	Average number of days attended by each pupil enrolled.
New York	113,011,361	744,148	152
Chicago	46,746,372	301,172	155
Philadelphia	28,079,683	174,441	162
St. Louis	13,581,600	87,931	155
Boston	16,996,617	111,632	152
Cleveland	10,871,764	74,438	146
Baltimore	10,607,101	79,838	133
Pittsburg	8,930,000	57,215	156
Détroit	8,265,984	57,996	143
Buffalo	9,072,000	62,695	145
San Francisco	6,790,632	43,155	157
Milwaukee	7,401,641	42,372	175
Cincinnati	7,127,800	47,454	150

Baltimore has the least satisfactory distribution of pupils among the various grades, of all the 13 cities above 350,000 population. It is desirable that a city hold its pupils in school as long as possible, at least up to the end of the eight-year elementary course. The city, therefore, having the largest percentage of pupils in the upper grades and the smallest percentage in the lower grades stands highest in this respect, while the city in which the reverse condition is true stands lowest. In Baltimore the percentages of enrollment in each of the first four grades are the highest of all cities but one (a different city in each grade), while in the fifth grade Baltimore has the lowest but four, and in the sixth, seventh, and eighth the lowest of all. In the high schools the percentage of enrollment for the first and fourth years is the lowest but three, for the second the lowest but one, for the third the lowest but two, and for the entire high-school enrollment the lowest but three.

The following tables and accompanying diagram show by absolute figures and percentages the distribution of the enrollment in the various grades in 1910 for each of 17 cities:[1]

[1] These statistics were gathered by the United States Bureau of Education for 1910. In some cases the school census for some day during the school year 1909–10 is given; in others, the number belonging upon a certain day; in others, the total enrollment for the year. These figures are comparable, for the reason that practically the same distributions of enrollment would be shown for any city under all three items. The Baltimore statistics are the "number belonging, including temporary withdrawals," Dec. 31, 1909.

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TABLE 21.—*Enrollment by grades in elementary schools and by years in secondary schools in cities of 300,000 population and over, 1910.*

	Cities.	Total elementary and secondary enrollment. (Cols. 3–14.)	Elementary school grades.								Secondary school years.			
			First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	First.	Second.	Third.	Fourth and fifth.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	New York	599,622	64,947	86,346	83,814	80,787	76,105	68,514	57,693	41,217	19,983	11,071	6,115	3,030
2	Chicago	274,705	54,867	34,984	38,088	34,526	31,651	25,462	20,976	16,370	8,736	4,648	2,580	1,817
3	Philadelphia	165,514	31,536	27,528	26,236	22,541	18,712	14,137	9,434	6,222	3,885	2,760	1,750	773
4	St. Louis	65,176	10,810	10,097	9,330	9,500	7,287	5,725	4,465	3,608	1,931	1,071	747	605
5	Boston	87,681	13,650	10,437	9,247	9,867	9,790	9,239	8,255	7,635	3,587	2,627	1,659	[1] 1,688
6	Cleveland	67,664	12,597	9,960	8,752	8,222	7,223	6,120	4,924	3,870	2,630	1,454	1,033	879
7	Baltimore	66,827	13,876	11,040	10,139	9,215	7,175	5,145	3,618	2,402	1,837	1,124	712	544
8	Detroit	50,446	9,588	6,582	6,398	6,334	4,995	4,434	3,656	2,828	2,590	1,147	950	944
9	Buffalo	53,372	9,180	6,183	6,014	5,834	5,921	5,004	4,480	[2] 3,796	962	1,244	1,002	751
10	San Francisco	43,155	10,071	5,698	5,211	4,981	4,521	3,847	2,872	2,409	1,901	885	412	347
11	Milwaukee	35,765	5,301	4,376	4,315	4,281	4,253	4,035	3,416	2,508	1,436	820	549	475
12	Cincinnati	41,640	7,143	5,593	5,437	5,157	4,659	4,238	3,202	2,469	1,823	919	587	413

[1] Does not include 421 pupils in high school pursuing irregular course.
[2] Buffalo has 3,001 pupils enrolled in the ninth grade.

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TABLE 22.—*The percentage of total enrollment found in each grade in elementary schools and for each year in secondary schools (based on Table 21).*

	Cities.	Elementary schools, percentage in—									Secondary schools, percentage in—				
		First grade.	Second grade.	Third grade.	Fourth grade.	Fifth grade.	Sixth grade.	Seventh grade.	Eighth grade.	Ninth grade.	First year.	Second year.	Third year.	Fourth and fifth years.	Total high school.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	New York	10.9	14.4	14.0	13.5	12.7	11.4	9.6	6.9	.....	3.3	1.8	1.0	.5	6.6
2	Chicago	19.9	12.8	13.9	12.6	11.5	9.3	7.6	6.0	.....	3.2	1.7	.9	.6	6.4
3	Philadelphia	19.1	16.7	15.8	13.6	11.3	8.5	5.7	3.8	.....	2.3	1.7	1.0	.5	5.5
4	St. Louis	16.6	15.5	14.3	14.6	11.2	8.8	6.9	5.5	.....	3.0	1.6	1.1	.9	6.6
5	Boston	15.6	11.9	10.5	11.3	11.2	10.5	9.4	8.7	.....	4.1	3.0	1.9	1.9	3.2
6	Cleveland	18.6	14.8	12.9	12.1	10.7	9.0	7.3	5.7	.....	3.9	2.2	1.5	1.3	8.9
7	Baltimore	20.8	16.6	15.2	13.8	10.8	7.7	5.4	3.6	.....	2.7	1.6	1.0	.8	6.1
9	Detroit	19.1	13.1	12.7	12.5	9.9	8.8	7.3	5.6	.....	5.2	2.2	1.8	1.8	11.0
10	Buffalo	17.3	11.7	11.4	10.9	11.1	9.3	8.4	7.1	5.6	1.8	2.3	1.8	1.3	7.2
11	San Francisco	23.3	13.2	12.1	11.6	10.5	8.9	6.7	5.6	.....	4.4	2.0	.9	.8	8.1
12	Milwaukee	14.9	12.3	12.1	12.0	11.9	11.3	9.5	7.0	.....	4.0	2.2	1.5	1.3	9.0
13	Cincinnati	17.2	13.4	13.1	12.4	11.2	10.2	7.7	5.9	.....	4.4	2.2	1.4	.9	8.9
	All cities	15.69	14.15	13.70	13.00	11.70	10.05	8.21	6.32	.....	3.32	1.92	1.15	.79	7.18

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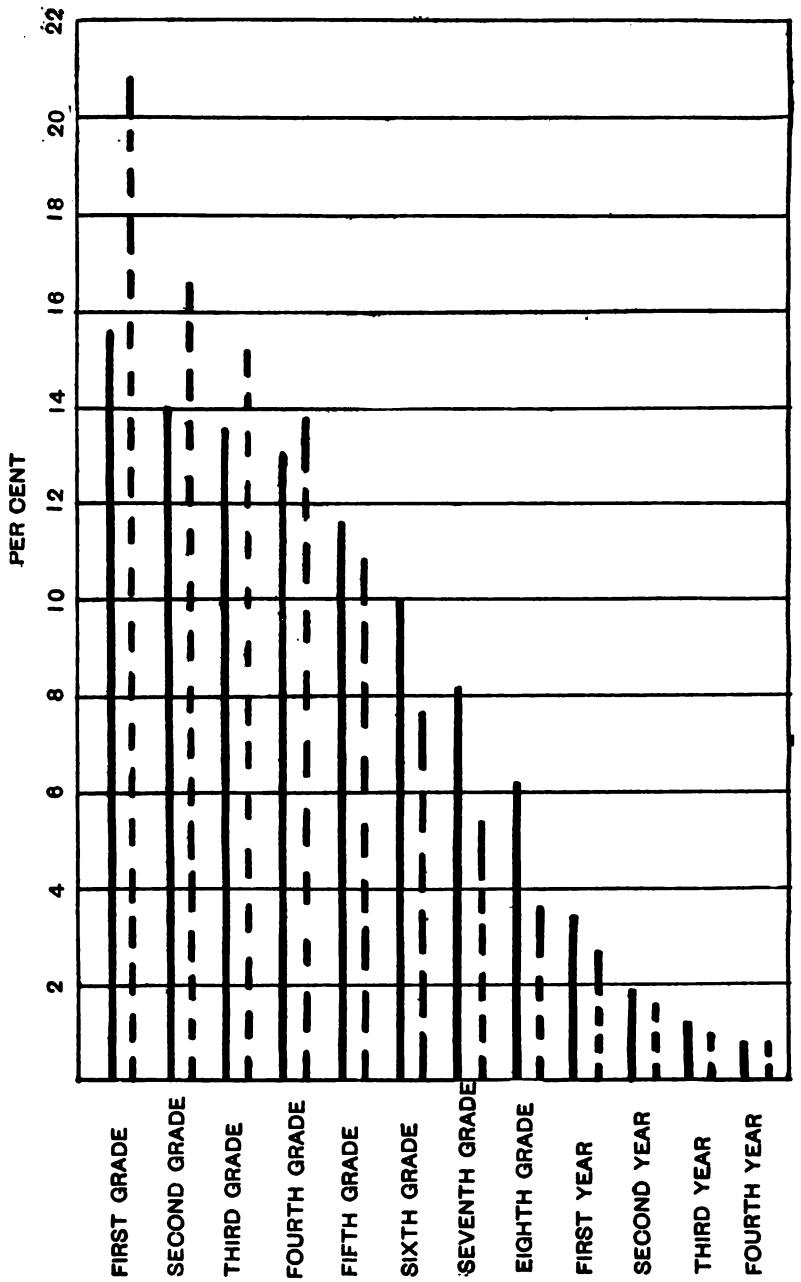

FIG. 12.—Percentages of pupils enrolled in each grade in Baltimore and in all cities, based on Table 22. The broken line represents Baltimore; the solid, all cities.

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Notwithstanding these facts, conditions have improved in Baltimore since 1899. Table 23, furnished by the superintendent of public instruction, Baltimore, shows absolute decreases in the enrollment in the two lower grades, small increases in the third and fourth, and larger increases in the fifth and higher grades. Table 24 shows the percentages of the total enrollment in each grade each year and the change in those percentages from the percentages of 1899. Fig. 13 illustrates the changes.

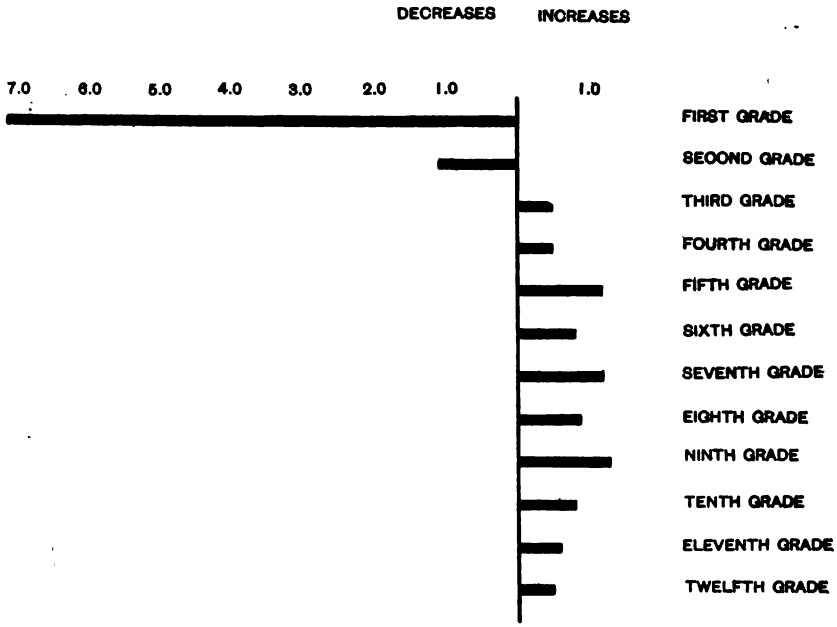

FIG. 13.—Changes in distribution of enrollments in Baltimore between 1899 and 1909, based on Table 24.

Statistics prepared by the principals of two groups for the past 10 years show a large decrease in the length of time required for pupils to complete a grade. This means that there is less retardation in these groups than formerly. What is true of these groups is probably true to a lesser extent in all the other groups.

It appears, then, that as regards the attendance of pupils there are some favorable indications and others that are unfavorable. The slight decrease in the enrollment during the past few years is of minor importance, in view of the fact that the proportion of enrollment to population in Baltimore is high as compared with other cities of the same group. The increase in the average daily attendance, despite the decrease in the enrollment, is encouraging. While the considerable increase in the enrollment in the upper grades during the past

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TABLE 23.—*Enrollment by grades in the public schools of Baltimore for the years 1899–1909, inclusive.*

Years.	Total elementary and secondary enrollment.	Elementary school grades.								Secondary school years.			
		First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	First.	Second.	Third.	Fourth.
1899	65,289	19,059	11,360	9,391	8,568	6,132	4,392	2,703	1,693	899	572	289	231
1900	64,721	18,277	11,553	9,658	8,269	6,211	4,431	2,776	1,707	849	456	320	214
1901	64,856	15,816	12,842	10,240	8,535	6,231	4,495	2,884	1,784	948	516	308	257
1902	66,273	17,102	12,354	10,305	8,585	6,447	4,274	2,863	2,023	1,029	641	367	283
1903	67,232	17,120	12,257	10,259	8,885	6,494	4,487	3,005	2,011	1,189	699	471	355
1904	67,215	16,676	12,000	10,456	8,701	6,668	4,611	3,082	1,992	1,324	787	513	405
1905	67,763	16,208	12,511	10,673	8,655	6,717	4,543	3,291	1,987	1,279	893	555	456
1906	69,364	16,419	12,470	11,153	9,085	6,677	4,963	3,120	2,171	1,354	889	613	450
1907	68,550	15,443	12,002	11,106	9,184	6,679	4,956	3,455	2,220	1,432	940	644	489
1908	68,690	15,506	11,188	10,800	9,179	7,269	5,036	3,495	2,379	1,707	971	662	498
1909	67,877	14,926	11,040	10,139	9,215	7,175	5,145	3,618	2,402	1,837	1,124	712	544

TABLE 24.—*Percentages of total enrollment in each grade of the Baltimore public schools for the years 1899–1909, inclusive, together with amount of increase or decrease from percentages for 1899, based on Table 23.*

Years.	Elementary school grades.																Secondary school years.							
	First.	Change.	Second.	Change.	Third.	Change.	Fourth.	Change.	Fifth.	Change.	Sixth.	Change.	Seventh.	Change.	Eighth.	Change.	First.	Change.	Second.	Change.	Third.	Change.	Fourth.	Change.
1899	29.2	.....	17.4	.....	14.4	.....	13.1	.....	9.4	.....	6.7	.....	4.1	.....	2.6	.....	1.4	.....	0.9	.....	0.4	.....	0.3	.....
1900	28.2	−1.0	17.8	+0.4	14.9	+0.5	12.8	−0.3	9.6	+0.2	6.8	+0.1	4.3	+0.2	2.6	+0.0	1.3	−0.1	.7	−0.2	.4	+0.0	.3	−0.0
1901	24.4	−4.8	19.8	+2.4	15.8	+1.4	13.2	+ .1	9.6	+ .2	6.9	+ .2	4.4	+ .3	2.7	+ .1	1.1	+ .1	.8	− .1	.4	+ .0	.3	+ .0
1902	25.8	−3.4	18.7	+1.3	15.6	+1.2	12.7	− .4	9.7	+ .3	6.5	− .2	4.3	+ .2	3.1	+ .5	1.6	+ .2	1.0	+ .1	.5	+ .1	.4	+ .1
1903	25.4	−3.8	18.2	+ .8	15.3	+ .9	13.3	+ .2	9.7	+ .3	6.7	− .0	4.5	+ .4	3.0	+ .4	1.8	+ .4	1.1	+ .2	.7	+ .3	.5	+ .2
1904	24.8	−4.4	17.9	+ .5	15.6	+1.2	13.0	− .1	9.9	+ .5	6.9	+ .2	4.6	+ .5	3.0	+ .4	2.0	+ .6	1.2	+ .3	.7	+ .3	.6	+ .3
1905	23.9	−5.3	18.4	+1.0	15.7	+1.3	12.8	− .3	9.9	+ .5	6.7	− .0	4.8	+ .7	2.9	+ .3	1.9	+ .5	1.3	+ .4	.8	+ .4	.6	+ .3
1906	23.7	−5.5	18.0	+ .6	16.1	+1.7	13.1	.0	9.6	+ .2	7.2	+ .5	4.5	+ .4	3.1	+ .5	2.0	+ .6	1.3	+ .4	.8	+ .4	.6	+ .3
1907	22.5	−6.7	17.5	+ .1	16.1	+1.8	13.4	+ .3	9.7	+ .3	7.2	+ .5	5.0	+ .9	3.2	+ .6	2.0	+ .7	1.4	+ .5	.9	+ .5	.7	+ .4
1908	22.6	−6.6	16.3	−1.1	15.7	+1.3	13.4	+ .3	10.6	+1.2	7.3	+ .6	5.0	+ .9	3.5	+ .9	2.5	+1.1	1.4	+ .5	.9	+ .5	.7	+ .4
1909	22.0	−7.2	16.3	−1.1	14.9	+ .5	13.6	+ .5	10.6	+1.2	7.5	+ .8	5.3	+1.2	3.5	+ .9	2.7	+1.3	1.7	+ .8	1.0	+ .6	.8	+ .5

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10 years is likewise encouraging, the unusually large proportion of the enrollment still found in the lower grades, the large percentage of retardation, and the low average number of days attended by each child, are facts to be deplored.

THE HEALTH OF PUPILS.

Responsibility for the health of pupils rests primarily with the health department of Baltimore. As early as possible in the school year, the schools are visited by a medical inspector accompanied by a school nurse. Each child is examined and results of the examination are noted on a convenient form, which is retained by the school nurse. In case it is found necessary to advise medical treatment the parents are notified and wherever possible the nurse visits the homes and learns how the instructions are being obeyed. Later in the year the children are reinspected, and the results of the examination are indicated on the form used for the first examination.

So much of the medical examination as has come under the personal observation of the commission has made a decidedly favorable impression.

The condition of medical inspection in the 13 largest city public-school systems is given in the following table, which is derived from a report covering conditions in 1,038 cities, entitled "What American cities are doing for the health of school children," recently published by the department of child hygiene of the Russell Sage Foundation.

TABLE 25.—*Medical inspection in certain city public-school systems, 1911.*

Cities.	Year work was begun.	Inspection for contagious diseases.	Vision and hearing tests by teachers.	Vision and hearing tests by physicians.	Physical examination by physicians.	System under board of education or board of health.	Number of school physicians.	Number of school nurses.	Inspection by dentists.
New York	1897	×	×	×	×	H.	142	142	.....
Chicago	1907	×	.....	×	×	H.	100	40	.....
Philadelphia	1904	×	.....	×	×	H.	30	9	×
St. Louis	1909	×	.....	×	×	E.	6	5	.....
Boston	1894	×	×	.....	.....	H.	80	34	.....
Cleveland	1910	×	.....	×	.....	E.	15	15	×
Baltimore	1905	×	.....	×	×	H.	5	5	.....
Pittsburg	1910	.....	.....	.....	.....	H.	30	.....	.....
Detroit	1902	×	×	×	.....	H.	27	6	.....
Buffalo	1907	×	.....	×	×	H.	.....	3	×
San Francisco	1907	×	.....	×	×	H.	1	4	.....
Milwaukee	1909	×	.....	×	×	E.	10	4	.....
Cincinnati	1905	×	×	×	.....	H.	25	3	×

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THE CONTROL AND DISCIPLINE OF PUPILS.

The commission found little to criticize in the behavior or conduct of pupils as they were observed in the schools. In the main they were seen to be industrious, studious, attentive, orderly, punctual, obedient, and polite. It feels, therefore, that the children are, as a result of their school life, acquiring habits of behavior which will be of inestimable value to those children all their lives and to the community in which they will live. The schools in Baltimore or elsewhere are worth all they cost in giving multitudes of children these habits of self-control.

In a few schools, however, the children are not in good order, as stated elsewhere in this report, and the general relationship existing between teachers and pupils in those schools is unsympathetic; but the exception only proves the rule.

The commission is not in accord with the agitation for the restoration of corporal punishment in elementary schools. Such restoration would be a step backward. Under proper restrictions, however, the use of corporal punishment might be allowed in the special schools for boys.

Various agencies may be used, and in fact are in use in Baltimore, which afford effective means of control of troublesome pupils. Special schools, already established, of various sorts, afford one means of control, and the extension of industrial training, particularly for boys, is another means. Many boys 12 to 14 years of age in Baltimore and elsewhere, are in a state of unconscious protest against the traditional, bookish, or conventional course of study. They are in the minority, it is true; they are not bad boys. They need a different kind of school from the one afforded by a mere academic course of study. They may in most cases be saved to themselves and to the State if their peculiarities are recognized. Whipping them into submission is not the best way to reform them. Industrial training is the way advocated by those who have had first-hand and prolonged experience with such boys. The experience, too, of many cities amply demonstrates the truth of this.

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CHAPTER V.

ADDITIONAL VIEWS AND SUGGESTIONS.

GENERAL CONSIDERATIONS.

More and more society is coming to lean hard upon public education. Every new public interest, whatever it may be, becomes another argument in favor of good schools. A city board of education is charged with providing, for the community as a whole, the best educational opportunity that can be made generally available. We regard the schools as a main reliance of modern society for the promotion of both private righteousness and devotion to the public good, as well as for the diffusion of that intelligence and discipline which will make these high aims and sentiments effective.

To accomplish these results, in the largest progressive communities whose public institutions are generously maintained, already calls for from 25 to 35 per cent of all revenues for municipal purposes, and will in all probability, within the near future, absorb normally from one-third to two-fifths of those revenues.

It is accordingly a matter of the utmost consequence in all of our cities that the public schools be conducted in ways that will bear the closest scrutiny as regards economy of expenditure and efficiency in all of their operations; as regards the municipal pride and self-respect which they exemplify and foster; and as regards their democratic fairness in providing equal opportunity for all and in discountenancing faction and favoritism. A general inquiry into the condition of the schools, at stated intervals of not more than 10 or 12 years, would serve a useful purpose.

Attention is invited to the following general considerations regarding ways in which these high ends may be attained:

THE BOARD OF EDUCATION.

City school boards should not be too large; they should be representative of the city as a whole, and not of districts or wards; they should be composed of citizens who are deeply interested in the public welfare; their members should not represent political parties or factions within the city, should go out of office a few at a time, and should not be paid for their services.

A board of education should be primarily a legislative body. Its chief functions should be to decide questions of policy, both immediate and future; to arbitrate disputed questions, of large impor-

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tance; to oversee the expenditures of the school funds; to decide what enlargements and additions shall be made, and to secure funds to carry out such objects; to adopt rules and regulations for the management of the school system; and to appoint all necessary executive officers, clothe them with proper authority, and uphold them in the discharge of their duties.

Such a board should represent the whole people in their desire to provide good schools for their children. They should be made sufficiently free from other branches or departments of the city government to enable them to make all necessary arrangements, appointments, and expenditures for public education apart from any personal or political considerations which may affect other branches or departments. Their functions fall into the two divisions of educational and business management. The first is highly professional work, the object of which is to get as large educational results out of the money available as is possible. The second partakes of the character of all sound business.

(*a*) *Educational management.*—The head of this department is the superintendent of schools, together with his corps of assistants. He should be selected with great care, and from the Nation as a whole rather than from a single city, or State. Once selected, he should be clothed with authority commensurate with his responsibility, and then expected to get the desired results.

The independence of the superintendent as the chief executive officer in educational affairs should be recognized by the members of the legislative branch, and no member of a school board should seek to interfere with him in any way in the exercise of his duties as defined by law and regulation. The rule of mutual respect and helpfulness should prevail between the two branches of the school department. A superintendent should not attempt to carry out any policy that has not been previously approved by the board, nor to dictate policies, for his function in the framing of new policies ends with recommendation. Board members, on the other hand, should not have any direct participation in affairs which are within the field of executive action and discretion. The superintendent and his assistants, after being given a fair opportunity to discharge their proper functions, stand or fall according to the value of the results which they obtain.

(*b*) *Business management.*—To a limited extent, the same principles apply as well to the control of the business side. After hearing the reports and recommendations of the business manager, superintendent of buildings, and other business officers, the board should decide what is advisable and financially possible, but the execution of the details should be left to these executive officers. If they are not competent to attend to such details, they should be replaced by those who are competent.

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QUESTIONS OF FINANCE.

Nowhere does a board of school commissioners better represent the interests of the people than in the matter of school expenditures. The broad principles set forth above apply here also. It is not the interests of individuals that are to be chiefly considered, but the interests of the city as a whole. The board, in a way, must represent and be the spokesmen for the future citizens of the city as well as for the present citizens. A board which properly fulfills its function and justifies its existence must consciously work in the light of an educational policy that looks a generation ahead.

THE ORGANIZATION OF THE SCHOOLS.

As regards the organization of the schools, the board must be guided largely by the advice of its educational officers, but should plan an educational system which will meet the needs of a growing city and of all of the people of the city. Our schools to-day render but a portion of their possible service, but in the more progressive communities their scope is rapidly expanding. A great extension of our public school systems, to meet the many educational needs of many different classes of our population, is to be expected and is indeed already under way.

THE SYSTEM OF SUPERVISION.

The central figure in a system of city school administration is the superintendent. The problems he is required to study are so many and so large as to render it impossible for him to spend much time in actual school visitation or in working out the finer details of school instruction. His chief reliance for such work must be placed in assistant superintendents and supervisors. Unless these are efficient, adequate in number, and thoroughly trustworthy, he can do little to advance the efficiency of the schools.

Next to the superintendent and his immediate assistants are the school principals. Upon their efficient and hearty cooperation in all efforts deemed to be for the good of the school system, the success of the efforts of the superintendent must depend, and no board should attempt to hold a superintendent accountable for educational results unless, at the same time, it holds every principal accountable in turn to the superintendent. Differences should be frankly threshed out in conferences; for the relation of a superintendent to his subordinates is partly that of a leader in a democracy as well as partly that of a manager in an industrial enterprise. But when a policy has once been decided upon, it should be loyally carried out by the principals. Principals who can not or will not render effective cooperation in the carrying out of such a policy should be relieved from their positions, in the interests of the schools. Other things being

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equal, those persons will make the best principals and supervisor who have known some other school system in addition to the one they are to supervise.

THE TEACHERS.

The same principles apply, though with somewhat less force, to the teaching corps of a city. What is wanted is the best company of teachers obtainable for the money which can be provided; and the interests of the children for whom the schools exist, and not the interests of individuals, should be the ruling principle.

The best results within a school system may be expected under some form of indefinite tenure of position for all teachers, principals, and supervisors. By this is meant neither life tenure nor unstable tenure, but rather some form of appointment under which a teacher may be dismissed for serious offenses at any time and for general inefficiency at the end of any year. This is nominally the case where teachers may legally be dismissed for cause shown in a formal hearing or trial; in practice, however, such a system guards the teacher's tenure of office more perfectly than it guards the educational rights of the children. It is the middle ground of fairness to both pupils and teachers which is here advocated.

The training provided for prospective teachers should be as good as money can secure. The training-school teachers should be drawn freely from those cities and professional schools which are well known for their efficiency, and at liberal salaries. The training schools should be made a social center for the girls while in training, and a professional center for the teachers of the whole city as well.

It is always wisdom on the part of a city to pay its teachers adequate salaries. There is no reason that will justify paying a teacher less than a fireman, a policeman, or an employee at the city hall, and many reasons for paying them more. Teachers should be able to earn interest on the investment made in years of study and special training, and have money for travel and study besides.

Our city school systems are moving forward at a reasonably rapid rate toward a condition in which their teaching force will be made up of teachers having a good general education, together with an adequate course of special training for the vocation of teaching. When they are fairly placed on this professional basis, it is desirable that a large measure of responsibility for the general interests of the schools shall be laid directly on this professional body.

At the present time the professionalizing of teaching is accomplished only in part. We are at an intermediate stage of our scholastic development. Such a stage requires readjustments, which must extend over some years and will accordingly call for much patience on the part of all concerned. There should, however, be a steady

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advance toward the end in view, which is that of a thoroughly trained teaching body permeated with the highest professional spirit. Such a teaching force will manifest their professional spirit in making it their first concern to promote the good and the general usefulness of the schools with a fair understanding of what is best for the schools. As their ability to interpret the needs of the community on the side of public education develops, and their power to formulate plans for meeting these needs increases, in just such proportion should their views be increasingly recognized in the shaping of educational policies and practices that affect directly their professional status and professional activities.

THE INTEREST OF THE COMMUNITY.

It is desirable that there should be channels through which the opinion of the public, and particularly of that public which is most directly interested in the schools, may regularly reach the superintendent of schools and the board of education. Associations of the parents of school children and other nonprofessional education societies may be made of the greatest usefulness, if they shall keep alive the discussion of educational questions and act as unofficial advisers of the board of education. Such free and sustained discussion is better than spasmodic discussion in time of controversy followed by inattention to educational questions till another controversy shall arise. The rapid enlargement of school activities at this time renders it doubly desirable that every effort shall be made to cultivate a general, discriminating, and progressive interest in the problems of public education.

SUPPLEMENTARY SUGGESTIONS.

As the conditions and needs of the educational system have been considered, it has become increasingly evident that many of the deficiencies in the Baltimore school system have their roots in the legal basis of that system. For that reason it has seemed to the commission that it would not perform its full duty in the premises if it failed to point out certain ways in which the legal organization and features closely related thereto could be improved to the advantage of the entire school system. Accordingly the commission makes the following suggestions in addition to its recommendations relating to the system of education:

1. The commission suggests that the board of school commissioners, the board of estimates, and the council give careful consideration to the question of providing ways and means whereby sufficient funds may be made available to afford support for the schools of Baltimore equal in amount per pupil to the prevalent standard for cities having a population of 300,000 and over. The object requiring the

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greatest amount of funds is that of salaries of teachers in elementary schools. Increases of appropriation for normal, evening, vacation, and special schools are also demanded in order to give the school system the scope that generally prevails. Expenses for rent should be reduced as quickly as possible by the erection of suitable schoolhouses owned by the city.

2. In comparing the department of education as it exists in Baltimore with the forms of local government for the conduct of schools in other large cities, we at once meet a fundamental distinction. Schools in certain large cities are established and regulated not by the municipal government, but by a corporation usually called an independent school district, which has no connection with the municipal government, save that as a matter of convenience the municipality collects the taxes levied by the district. The cities of St. Louis, Boston, Cleveland, Cincinnati, Indianapolis, and Denver constitute such independent school districts. On the other hand, schools are administered under departments of the municipal government in New York, Philadelphia, Chicago, Baltimore, San Francisco, and New Orleans. There seems to be no general tendency toward either one of these forms of organization and away from the other, each city continuing on in the same way as formerly, modifying certain features of the organization from time to time, but not changing the form as a whole. However, it is believed that the advantages of independent districts as a class are worthy of careful consideration. The comparative advantages of the two forms of organization can not be fully presented here. It is evident, however, that some of the most important hindrances to the development of the Baltimore schools lie in the limitations that are now imposed upon the board of school commissioners by its subordinate relationship to the municipal government.

An independent district should not be substituted for the department unless the election by popular vote from the city as a whole, and not by wards, of a small nonpartisan board composed of honest men of superior intelligence and efficiency is practically assured. Some of the present hindrances can be removed without abolishing the department, and no doubt further modification of an institution so long established would be more easy, though probably not so effectual, as the more radical step of putting another form of organization in its stead.

3. It is the belief of the commission that the city charter might with advantage be so modified as to place all matters pertaining to the purchase of sites, the erection and repair of buildings, and the purchase of equipment and supplies in the board of school commissioners. In this connection, it is also suggested that the making of lump-sum rather than specific appropriations by the council for the

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extension of the school plant would probably lead to greater economy and efficiency in this feature of public-school administration.

It is practically a universal experience that there is frequent friction wherever a department of a city government other than the education department has charge of the purchase of sites or the erection and repair of school buildings.

The following table will show the practice in all of the 18 cities above 300,000 population as regards the purchase of sites, the erection and repair of buildings, and the purchase of supplies and equipment. It will be observed that in only 4 of these cities are the sites purchased and buildings erected by another department of the municipal government:

Names of cities.	Sites purchased by—	Buildings erected by—	Buildings repaired by—	Supplies purchased by—
New York	Board of education.	Board of education.	Board of education.	Board of education.
Chicago	do	do	do	Do.
Philadelphia	Board of public education.	Board of public education.	Board of public education.	Board of public education.
St. Louis	Board of education.	Board of education.	Board of education.	Board of education.
Boston	School board	School board	School board	School board.
Cleveland	Board of education.	Board of education.	Board of education.	Board of education.
Baltimore	Other departments.	Other departments.	Other departments.	Board of school commissioners.
Pittsburg	Subdistrict school board.[1]	Subdistrict school board.	Subdistrict school board.	Central board of education.
Detroit	Board of education.	Board of education.	Board of education.	Board of education.
Buffalo	Common council	Department of public works.	Department of public works.	Department of public instruction.
San Francisco	Board of supervisors.	Board of public works.	Board of public works.	Board of education.
Milwaukee	Board of school directors.	Board of school directors.	Board of school directors.	Board of school directors.
Cincinnati	Board of education.	Board of education.	Board of education.	Board of education.
Newark	do	do	do	Do.
New Orleans	City council	City council	Board of directors.	Board of directors.
Washington	Commissioners of the District of Columbia.	Commissioners of the District of Columbia.	Commissioners of the District of Columbia.	Commissioners of the District of Columbia.
Los Angeles	Board of education.	Board of education.	Board of education.	Board of education.
Minneapolis	do	do	do	Do.

[1] High-school sites are purchased and buildings are erected by the central board of education.

4. In our judgment, careful consideration should be given to the question whether the charter requirement that the mayor's appointments to the board of school commissioners shall be confirmed by the second branch of the city council is a desirable provision. The present tendency in municipal affairs is toward a more definite placing of responsibility.

Turning to other cities, we find that in no large city is the appointment of members of school boards either by the mayor or by judges of the court confirmed by another body. The tendency in municipal government is to make administration simple and direct, so that

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each officer may be held accountable and receive his proper proportion of praise or censure. The following table shows the facts concerning method of appointment and composition of school boards in all cities in the United States having over 300,000 population:

School board of—	Number of members.	Term in years.	Selected by—	Chosen from—
New York	46	5	Mayor	Boroughs.
Chicago	21	3	do	City.
Philadelphia	21	3	Court of common pleas	Wards.
St. Louis	12	6	Popular vote	City.
Boston	5	3	do	Do.
Cleveland	7	4	do	Do.
Baltimore	9	6	Mayor and confirmed by second branch of city council.	Do.
Pittsburg	45	3	By local boards	Districts.
Detroit	18	4	Popular vote	Wards.
Buffalo [1]				
San Francisco	4	4	Mayor	City.
Milwaukee	15	6	Popular vote	Do.
Cincinnati	27	4	do	3 at large, 24 by wards.
Newark	9	3	Mayor	City.
New Orleans	20	4	17 by popular vote, 3 ex officio	Ward.
Washington, D. C	9	3	Supreme court judges of District of Columbia.	District of Columbia.
Los Angeles	7	4	Popular vote	City.
Minneapolis	7	6	do	Do.

[1] Has no school board proper. The council performs many of the duties usually performed by the board of education.

Every living system of schools will be found to be full of imperfections, full of things half done, full of plans and purposes which are only by slow degrees finding their way into effective practice. We have looked into the Baltimore schools in the spirit of practical men who discriminate between the jagged incompleteness of a growing concern and the finish and perfection of a completed machine which has no life in it. Our suggestions are offered, with all deference, in the hope that they may help a little in the effort the city of Baltimore has long been making to render its schools as effective an agency as possible for the purposes of public education.

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INDEX.

Administration, school, 45; history, legal basis, 28-33; tendencies during the decade, 28.
Algebra, instruction, 74, 78.
Architectural commission, powers under charter of 1898, 31.
Arithmetic, teaching, combinations, 77-78; directions to teachers, indorsed by commission, 73; (Smith) 73; specified topics, statistics of thirteen cities, 76; "spiral" method, 71-73, (Suzzallo) 72-73.
Arithmetic and alegebra, minutes per week devoted to, statistics of 12 cities, 74; percentage of school time devoted to (1890-1910-11), statistics of 8 cities, 74.
Assistant superintendent of public instruction, appointment ordered, 26.
Attendance, statistics, 92-98.
Backward pupils, provision for, 10.
Board of awards, powers under charter of 1898, 31.
Board of estimates, powers under charter of 1898, 31.
Board of school commissioners, established, 24; functions just previous to 1900, 29; letter to, 7-8; membership increased, 27; political considerations under old régime, 30; powers fixed by law, 26; powers under charter of 1898, 31; required to advertise for all purchases of $50 and over, 27; resolution regarding employment of commission, 16; term changed, 26.
Board of superintendents, powers under charter of 1898, 32.
Boards of education, opinions regarding organization and status, 102-108, 106-109.
Brown, *Dr.* E. E., conference with Gen. Lawrason Riggs and Mr. George A. Solter, 16; letter of transmittal, 5-6; letter to Mr. George A. Solter regarding commission, 17-18.
Charter, city (Mar. 24, 1898), passed, 27.
Chronological table, history of school system, 24-27.
City council, authority in management of schools, under act of Jan. 17, 1826, 29; under charter of 1898, 30; and mayor, authority to establish schools, 26.
City school boards, organization, 103-104.
City school systems, recent history, 21-23.
Coeducation, in 15 cities, statistics, 91; status, 14, 90-91.
Colored children, separate schools established, 26.
Commission, for selection of sites, powers under charter of 1898, 31.
Commission, to investigate public school system (1880), 26.
Commission, to study system of education in public schools of Baltimore, appointment, organization and work, 16-18; limits of study, 18-19; members and assistants, 6; method of study pursued by, 20-21.
Compulsory attendance, Massachusetts, 22.
Cooking school, opened, 27.
Courses of study, criticism, 13-14; elementary school, historical summary, 63-64; instructions from superintendent's office, 87-88; methods employed in making, 64-65; subjects in detail, 66-91; teachers consulted, 13.
See also under subjects.
Creery, W. R., appointed superintendent of schools, 26.
Cubberley, E. P., letter regarding appointment as member of commission, 17-18.
Curriculum. *See* Courses of study.
Department of education of Baltimore, comparison with other cities, 106.
Discipline, school, 101-102; status.
Drawing instruction, 84.
Education, trend during first decade of the twentieth century, 23.
Elementary schools, expenses, 39; per capita costs of total expenses, based on enrollment, comparison between five cities, 41; supervision, criticisms, and recommendations, 51; past and present conditions, 48-51; training and instruction, 48-91; variety in instruction, 10.
English-German school, established, 26.
English language, instruction, 66-71.
Enrollment, statistics, 93-100.
Evening schools, opened, 27.
Examinations, promotional, 12.
Expenditures, schools, 8-9.
Expenses, schools, 43; unit costs, 41.
Finance, questions of, 105.
Free library, established, 26.
Funds, school, suggestions regarding Baltimore, 107-108.
General revenues, total receipts from, 37.
Geography, teaching, 78-82; distribution of percentages of school time, 81; percentage of school time devoted to, statistics of eight cities, 81.
Geometry, teaching, 78.
Government school. *See* Discipline school.
Grammar, instruction, adverse criticism, 14; year of course in which study is begun, statistics of 13 cities, 68.
Group system of supervision, introduced, 27; recommendations regarding, 10-11.
Group teaching, and individual instruction, 89-90.
See also Sectional teaching.
Health of pupils, 100-101.
History, teaching, 83-84.
Home study, 91.
Improvement, school system, 9.
Individual instruction and group teaching, 89-90.
Industrial education, conditions, 14; demand for, 23; instruction, 86-87.
See also Manual training.
Inspector of buildings, powers under charter of 1898, 31.
Instruction, conduct of, 87-88; variety, elementary schools, 10.
Kendall, C. N., letter regarding appointment as member of commission, 17-18.
Latrobe commission, appointed, 26.
Letter of transmittal, 5-6.
M'Jilton, J. N., appointed superintendent of schools, 25.

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Manual training, centers established, 27; instruction, 86-87; introduction into American schools 22; introduction into public-school system, 14 *See also* Industrial education.
Manual training school, organized, 26.
Manufacturing, statistics (1905), 28.
Massachusetts, compulsory attendance, 22.
Mathematics, teaching, 71-78.
Maxwell, W. H., and sectional teaching, 10.
Mayor, duties under charter of 1898, 31; member ex officio of school board, 27.
Mayor and city council, authority to establish schools, 26; and board of school commissioners, relative powers regarding schools, 26.
Medical inspection of schools, statistics, 101.
Method of study of commission, 20-21.
Methods of teaching, 88.
Nature study, instruction, 82.
Normal, evening, vacation, and special schools, expenses, 39.
Normal training, provisions for, 13.
See also Teachers, training.
Occupations of inhabitants, number engaged in the principal (1900), 27; 10 years of age and over (1900), 27.
Organization under charter of 1898, 8.
Parents and schools, 107.
Penmanship, instruction, 69.
Physiology and hygiene, instruction, 84-86.
Political entanglements, danger, 9.
Politics, partisan, effect on school system, 8.
Population of Baltimore (1910), white 27; colored, 27.
Preparatory classes, best features of Baltimore system, 10; introduced, 27.
Promotional examinations, 12, 57-59, 61-62.
Property, assessed valuation of, subject to general property tax (1908), 28.
Public schools, establishment, 24; expenses, 34-37.
Pupils, health, 100-101; progress of, through the course, 46.
"Quincy methods," introduction into schools, 22-23.
Reading, teaching, 68-69.
Recitations, time allotment, 88.
Revenue, school, 38.
Riggs, *General* Lawrason, conference with Dr. E. E. Brown, 16.
Salaries, teachers. *See* teachers' salaries.
Schedules of work, teachers, 65.
School activities, widening of range, 23.
School boards, method of appointment and composition in large cities, 110.
School commissioners. *See* Board of school commissioners.
School expenses, total, 33.
Schoolhouses, condition, 14-15, 92.
School system, administration, 45; comparison with other cities, 21; criticisms, 20-21; danger of political entanglements, 9; expenditures, 9; expenses in detail, 39; financial support, 33; history, 24-27; improvement, 9; limits of study of the commission, 18-19; net result of inquiry, 8-9; observation of actual work, 20-21; organization, 105; partisan politics, effect, 8; scope, statistics, 44.
Secondary schools, expenses, 39, 43.
Secretary, board of school commissioners, duties, 33.
Sectional teaching, 10, 88; criticisms, 88-90; and Superintendent W. H. Maxwell, 10.
Shepherd, H. E., appointed superintendent of schools, 26.
Sites for schools, practice in eighteen cities, 109.
Smith, D. S., on teaching arithmetic, 73.
Solter, George A., conference with *Dr.* E. E. Brown, 16; letter to *Dr.* E. E. Brown, regarding commission, 16-17.
Spelling, teaching, 69-71; practice in certain cities, 70.
"Spiral method," arithmetic, 71-73; (Suzzallo) 72-73.
Subjects, old and new, percentage of school time devoted to, 66.
Subsidiary topics, 92-102.
Summary of report, 8-15.
Superintendent of public instruction, appointment, 25.
Superintendent of supplies, appointment, 26.
Supervision, schools, conditions of the past, 48-49; comparison with other cities, 10; criticism, 51-53; "horizontal" divisions, 11; larger provision desirable, 10; present policy and practice, 49-51; recommendations, 53-54; system, 105-106; tendency during the decade, 23; "vertical" divisions, 10.
Supervisor of school buildings, powers under charter of 1898, 32.
Supervisory officers, insufficient corps of, 11.
Supplies, superintendent of, appointment, 26.
Suzzallo, Henry, on "spiral method" of teaching arithmetic, 72-73.
System of education. *See* School system.
Taxation, assessed valuation and rate (1908), 28.
Teachers, admission to eligible list, 57; courses of study, 13; colored, 13; training school, 59; efficiency, 11-12; eligible list, 60; promotional examinations, 57-59, 61-62; ratio of, to supervising officers in cities of 300,000 population (1910), 51; salaries, 12; ordinance of June 12, 1890, 27; per capita cost, based on enrollment, comparison between five cities, 42; statistics of nine cities, 60; scale too low, 12; schedules of work, allotments in several grades, 65-66; tenure of office, 11; training, 55-63, 106-107; criticisms and recommendations, 59-62; training school, adequate housing and equipment recommended, 12; established, 27.
Teaching, character of, opinion, 62-63.
Training school for teachers, established, 27.
See also Teachers, training school.
Truants, habitual, provision for, 10.
Unit costs, 41.
United States Bureau of education, and work of commission.
Van Sickle, J. H., appointed superintendent of schools, 27.
Vocational training, demand for, 23.
Wise, H. A., appointed superintendent of schools, 26.

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AGE AND GRADE CENSUS OF SCHOOLS AND COLLEGES

A STUDY OF RETARDATION AND ELIMINATION

By GEORGE DRAYTON STRAYER
PROFESSOR OF EDUCATIONAL ADMINISTRATION IN TEACHERS COLLEGE, COLUMBIA UNIVERSITY

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CONTENTS.

	Page.
Letter of transmittal	5
The data collected	9
Grade populations of certain cities of 25,000 population and over (Table 1)	14
Grade populations of certain cities of less than 25,000 population (Table 2)	20
Distribution, by age, of pupils in the public schools (elementary and secondary) in certain cities of 25,000 population and over (Table 3)	29
Distribution, by age, of pupils in the public schools (elementary and secondary) in certain cities of less than 25,000 population (Table 4)	36
The number of pupils of normal age, more than the normal age, and less than the normal age of pupils in their respective grades in certain cities of 25,000 population and over (Table 5)	45
The number of pupils of normal age, more than the normal age, and less than the normal age of pupils in their respective grades in certain cities of less than 25,000 population (Table 6)	52
Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades in certain cities of 25,000 population and over (Table 7)	61
Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades in certain cities having less than 25,000 population (Table 8)	65
Percentage relation between the largest age group and the number found in each grade in certain cities of 25,000 population and over (Table 9)	70
Percentage relation between the largest age group and the number found in each grade in certain cities of less than 25,000 population (Table 10)	76
Frequency of percentages of various groups (Tables 11–89)	84
Some data concerning the student body in American colleges	137
Conclusion	139
List of references on retardation and elimination	141

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, January 31, 1911.

SIR: In view of the fact that statements commonly made concerning the attendance of pupils on our public schools are often misleading, a concerted effort has been made in the past few years, on the part of specialists in school administration and in educational statistics, to determine the facts of the case with greater precision. It has long been evident that the mere totals of annual enrollment in the different grades of the schools would not, without careful analysis and interpretation, show, for example, how large a proportion of the individual pupils in our public-school systems leave school at any given age. A number of interesting studies in this field, based on existing printed reports, have been made within the past 10 years. The attempt to determine approximately the meaning of the figures at hand was first made in a serious and comprehensive way, according to modern statistical methods, by Prof. Edward L. Thorndike, of Columbia University, in a monograph entitled "*The Elimination of Pupils from School,*" published in the Bulletin of the Bureau of Education (Bulletin No. 4, 1907). Prof. Thorndike's bulletin called forth a spirited discussion which culminated in the publication of an important work entitled "*Laggards in our Schools, a study of Retardation and Elimination in City School Systems,*" by Dr. Leonard P. Ayres, of the Russell Sage Foundation.

The desire was frequently expressed by those engaged in such studies that, as a basis for desirable comparisons, a census be taken of the children actually present in the schools upon some one given day on which an approximately normal attendance might be expected. In accordance with this desire, the taking of such a census in the first week of December, 1908, was requested by the Bureau of Education. This request was generally complied with by city and village school authorities and by the heads of educational institutions throughout the land. The reports embodying the results of this census were placed in the hands of Prof. George D. Strayer, of Teachers College, Columbia University, and Prof. Strayer has organized the materials so provided in the monograph herewith presented for publication.

I may call attention briefly to one aspect of the discussion of school attendance which has received special attention at the hands of all three of the writers referred to above. The question as to the percentage of pupils leaving school at any given age, or at any given stage of the curriculum, turns upon the question as to the actual

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number of different pupils who have entered the schools. This number is not commonly shown in school reports and is not easily determined. Prof. Thorndike proposed that the average of the enrollment of pupils in the first three grades of the school, with various corrections, be assumed as representing the number of different pupils entering the first grade. Mr. Ayres, who criticized this assumed standard, proposed a different standard of comparison, in the following terms: "The number of children beginning school each year is approximately equal to the average of the generations of the ages 7 to 12 in the school membership of the system." Prof. Strayer, in the monograph herewith presented, makes use of another basis of comparison, namely the largest age group as revealed by the census upon which his discussion is based. He holds that the greatest number of pupils of any one age found in any given school system is the nearest approximation now possible to the actual number of children entering the school in the year in which the census was taken.

I can best present the general outcome of the three studies conducted on the three different bases which have been mentioned by reproducing here a diagram presented by Dr. Ayres showing the comparison of his results with those of Prof. Thorndike, with an added line to make the further comparison with the results arrived at by Prof. Strayer in this monograph. The diagram with this addition would appear as follows:

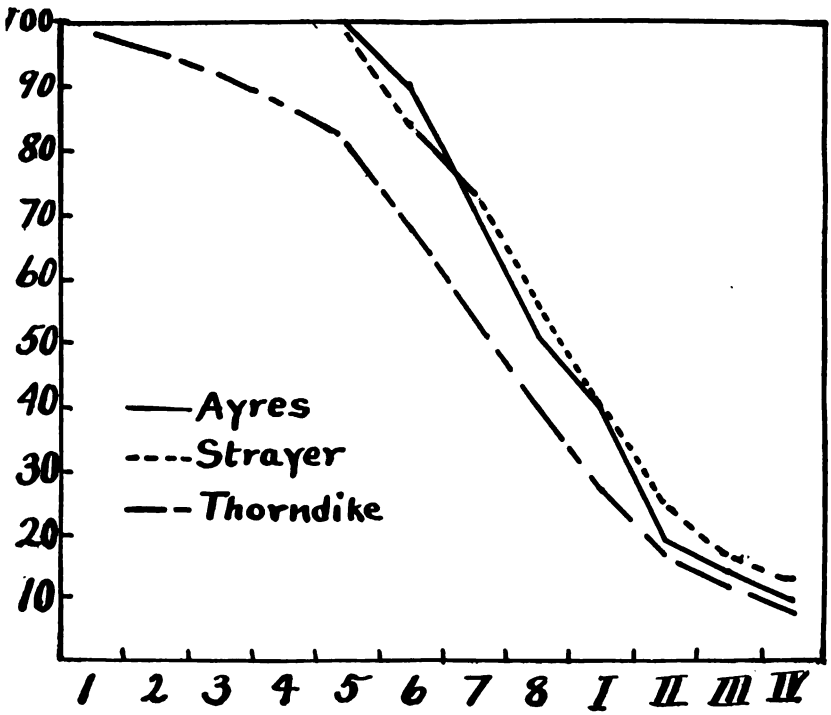

FIG. 1.—Showing actual number of children first entering school in any one year.

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It is to be noted that these different studies are based upon reports from city-school systems only, Prof. Thorndike making use of reports from 23 cities, Dr. Ayres from 58 cities, and Prof. Strayer from 318 cities. It is a notable fact that these several studies agree in the general conclusion that, after all corrections and allowances which can be made on the basis of our present information, the drop in the attendance of pupils in the grammar grades and the high school is still shown to be very great, the difference between the high school and the grammar school as regards this tendency being inconsiderable.

Aside from this one question as to the withdrawal of pupils from school the data which are here presented will be found of much use to students of practical educational problems, in a great many directions. There is, accordingly, abundant reason for their publication.

It should be added that in our statistical studies of school attendance we shall continue to be in the twilight, though not altogether in the dark, until a practicable method can be devised for keeping a separate record throughout his school course of each individual pupil, whether he remain in one school or follow the widespread American custom of migration.

Very respectfully, ELMER ELLSWORTH BROWN,
Commissioner.

The SECRETARY OF THE INTERIOR.

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AGE AND GRADE CENSUS OF SCHOOLS AND COLLEGES.

The data which are brought together in this bulletin concern elementary schools, high schools, and colleges, and were collected by a special inquiry of the Bureau of Education in December, 1908.

The data collected are significant primarily for the light which they throw upon the problems of retardation and elimination in our schools. In two cases the facts presented are analyzed somewhat carefully, viz, the number of children over age and under age, and the relation of the number of children in each grade to the entering group. The tables and diagrams, which bring together these facts of retardation and elimination, will give some indication of the situation for the cities of the United States and will make possible a comparison among the several cities reporting. These data will not fully explain the situation, but they will furnish a form or standard with which any situation can be compared. Not the least value that these statistics will have is the possibility of comparison which they will make possible 5, 10, or even 20 or more years from the present time.

If it had been possible, the age grade distribution for each city would have been given. Since it was not possible to use so much space, the data have been condensed into six tables (Tables 1 to 6 inclusive) which give, first, the number of pupils in each grade; second, the number of children of each age; and third, the number of children over age and under age in the elementary schools of certain cities.

Each institution receiving the inquiry was asked to furnish the bureau with an age grade census, that is, to fill out a blank calling for the information demanded by the form given on the following page.[1]

[1] More than 400 cities responded to this request, but because of incompleteness, inaccuracy, or delay in forwarding the reports to the bureau, it has been possible to use only 318 reports.

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Department of the Interior,
BUREAU OF EDUCATION,
WASHINGTON, D. C.
Statistical Division.

——— ——— *Name of city.*

——————— *State.*

SPECIAL.

The information under "Special," in all probability, will not be asked for again for at least five years. It is therefore of the utmost importance that it be given in complete form, and, of course, with great pains to attain perfect accuracy.

Give the number of pupils in your schools in each grade of each age. If possible take this census on *one* day the first week in December, 1908.

AGES OF BOYS.

Grade.	Under 5	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 or over.
Kg.																		
1st																		
2d																		
3d																		
4th																		
5th																		
6th																		
7th																		
8th																		
9th																		
1st H. S.																		
2d H. S.																		
3d H. S.																		
4th H. S.																		
5th H. S.																		

AGES OF GIRLS.

Grade.	Under 5	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 or over.
Kg.																		
1st																		
2d																		
3d																		
4th																		
5th																		
6th																		
7th																		
8th																		
9th																		
1st H. S.																		
2d H. S.																		
3d H. S.																		
4th H. S.																		
5th H. S.																		

On what date were these ages taken? ———

——— ———,
(Signature and title of officer making this report.)

——— ———,
(Post office and street address.)

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Tables 1 and 2, which give respectively the number of pupils in each year of the elementary school and of the high school in certain cities of 25,000 population and over and in certain cities of less than 25,000 population, indicate in some measure, if correctly interpreted, the persistence of children in our schools. A more accurate view of this situation can be had if the number of children in each grade is compared with the number of children entering school in any one year. On pages 70–83 such tables are given and commented upon. When one realizes that the number of children in each grade is made up of those who have entered the grade, or who have been promoted to it, those who have been left in it and are repeating the grade, those who have been demoted, and, in some cases, those who have re-entered but have not been included among the entering group, the danger of drawing conclusions from a table which gives simply the number in each grade becomes apparent. Tables 1 and 2 have been included, however, because it is possible from the data given in these tables to derive certain other tables which are used later in the report. This table is also valuable in that it indicates the situation that one may expect to find with regard to the distribution of children among the several grades at any time.

Tables 3 and 4 indicate the retention of children in city public schools, by showing how many children of each age were in school on the day the census was taken. These tables show the following age groups:

Age.	Number of cases.	Age.	Number of cases.
6	39	12	102
7	67	13	60
8	138	14	16
9	53	15	2
10	105		
11	56		638

Of the 638 cases (boys and girls counted separately) 402 have the largest age group at 10 or below, while only 236 have the largest age group at 11 or above.

In general the tables indicate that in our cities considerably more than half of the children are eliminated between the ages of 13 and 15 inclusive. It will be interesting to compare these figures with those that may be obtained later from cities which are planning to differentiate their course of study at the end of the sixth school year to meet the varying needs of their pupils.

Tables 5 and 6 give the total number of children in elementary schools on one day during the first week of December, 1908. It gives the number of boys and girls of normal age;[1] the number one year, two years, three years, four years, and five or more years

[1] For definition of normal age, see footnote on page 12.

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over the normal age for their grade; the total over the normal age for their grade; the number one year under age, two years under age, and the total under age. There is included as well in both the tables the largest age group and the age at which the largest group is found. The largest age group is the largest number of children in the elementary school found at any age. The following table shows the number of boys of each age in the Birmingham, Ala., schools:

Age.	Number.	Age.	Number.
6	50	12	353
7	355	13	319
8	380	14	211
9	407	15	135
10	363	16	40
11	384	17 and over	16

The largest age group is, therefore, 407 at 9 years of age. This largest age group is used throughout the study as the nearest approximation possible to the actual number of children entering school in the year 1908. The validity of this figure will become apparent when one remembers that the children who are in school have entered either at 5, 6, 7, 8, 9, or 10 or more years of age. Manifestly we could not commonly tell how many children enter school by taking those at 5 or 6 years of age, because some children will not enter until they are older. To take the average of the groups 7 years of age, 8 years of age, 9 years of age, 10 years of age, 11 years of age, and 12 years of age, would give a number somewhat too small, since, in most of our cities, because of the increase in population, the death rate for children, and the elimination of children from school the number in the upper ages would be too small. It would seem then that the generation of children entering school in any one year is best represented by the largest age group, which is precisely a generation of children, and since it is the largest it probably approximates more closely than any other that generation which has entered the schools during the current year. There are cases, of course, where this index would not hold. If the population were decreasing, for example, the largest age group might be too large; but for the country as a whole it is, undoubtedly, a very close approximation to the real fact.

Tables 7 and 8 give the per cent of the total number of boys and girls who are of normal age;[1] who are one year, two years, three years,

[1] Normal age in this study is defined as follows: Children who are 6 or 7 years of age in the first grade, 7 or 8 years of age in the second grade, 8 or 9 years of age in the third grade, and so on, are called normal. In some cases the ages selected as normal are undoubtedly too high. This is especially true in New England, where children commonly enter school between 5 and 6 years of age. For the whole country, however, taking into consideration the fact that the census was taken in December, the standard used was probably the best that could have been chosen.

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and four years or more retarded; the total per cent of pupils retarded; and the per cent of those who are one year or more younger than the normal age for their grade. These tables are the basis of the later tables of frequency and accompanying figures, which make it possible to see at a glance the situation for the whole country. These tables are important for those who desire to compare their own city with other cities of the same size or of like social and industrial conditions.

Tables 9 and 10 give the per cent of the largest age group found in each grade of the elementary and high school in each city. As is indicated in the interpretation of the tables of frequency and the accompanying figures, these tables, if correctly interpreted, give the facts of retardation and elimination.

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TABLE 1.—*Grade populations of certain cities of 25,000 population and over.*

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Elementary school grades.									High school years.			
		1	2	3	4	5	6	7	8	9	1	2	3	4
1	Birmingham, Ala.	814	518	482	449	329	250	171	.....	.....	146	83	60	17
		754	*556*	*517*	*473*	*379*	*319*	*211*	.....	.....	*191*	*136*	*98*	*75*
2	Mobile, Ala.	354	274	223	267	145	145	113	.....	.....	87	44	22	15
		311	*222*	*250*	*235*	*207*	*201*	*165*	.....	.....	*146*	*97*	*77*	*69*
3	Montgomery, Ala.	390	311	245	255	171	132	70	.....	.....	43	19	7	7
		379	*232*	*315*	*237*	*190*	*164*	*116*	.....	.....	*111*	*95*	*43*	*39*
4	Little Rock, Ark.	619	417	367	374	233	229	244	181	.....	91	70	41	30
		623	*450*	*406*	*392*	*285*	*271*	*264*	*205*	.....	*158*	*129*	*75*	*39*
5	Los Angeles, Cal.	2,580	1,864	1,877	1,947	1,842	1,626	1,373	1,074	.....	936	357	198	165
		2,184	*1,672*	*1,848*	*1,799*	*1,710*	*1,676*	*1,484*	*1,161*	.....	*858*	*387*	*263*	*226*
6	Pueblo (School District No. 20), Colo.	276	201	179	179	182	130	104	77	.....	53	49	27	17
		255	*158*	*178*	*197*	*174*	*140*	*118*	*90*	.....	*68*	*69*	*58*	*29*
7	Pueblo, Colo.	189	166	133	130	129	100	95	54	.....	55	28	16	9
		159	*189*	*153*	*180*	*140*	*98*	*116*	*77*	.....	*97*	*40*	*32*	*27*
8	Bridgeport, Conn.	1,589	883	965	806	631	407	283	154	.....	90	81	51	27
		1,556	*878*	*955*	*825*	*634*	*414*	*294*	*161*	.....	*99*	*103*	*68*	*48*
9	New Haven, Conn.	1,508	1,369	1,373	1,249	1,058	899	731	566	.....	437	232	185	112
		1,484	*1,296*	*1,296*	*1,281*	*1,065*	*964*	*740*	*456*	.....	*429*	*215*	*249*	*176*
10	Meriden, Conn.	256	221	215	234	210	172	153	112	89	90	50	15	16
		216	*184*	*190*	215	192	180	185	123	96	93	67	36	29
11	Waterbury, Conn.	762	663	588	600	516	428	313	214	164	125	85	56	43
		715	*601*	*636*	*548*	*510*	*398*	*326*	*226*	*194*	*140*	*103*	*72*	*61*
12	(*a*) Savannah, Ga.	391	381	391	260	273	163	119	96	.....	58	38	19	12
		339	*358*	*349*	*285*	*279*	*221*	*182*	*148*	.....	*117*	*81*	*51*	*13*
	(*b*) Savannah, Ga. (colored)	190	188	170	101	100	48	50	46	.....	.....	.....	.....	.....
		269	*212*	*225*	*185*	*176*	*116*	*73*	*65*	.....	.....	.....	.....	.....
13	Aurora, Ill.	207	126	133	114	98	99	145	126	.....	79	46	42	20
		178	*121*	*105*	*128*	*104*	*84*	*121*	*46*	.....	*87*	*57*	*47*	*24*
14	Aurora (west side), Ill.	64	75	80	53	71	51	43	35	.....	32	37	24	17
		71	*128*	*96*	*46*	*54*	*49*	*59*	*32*	.....	*29*	*42*	*35*	*18*
15	Chicago, Ill.	20,509	15,955	16,774	14,742	13,679	11,037	8,761	6,985	.....	3,026	1,536	975	618
		17,730	*14,445*	*15,996*	*13,718*	*13,027*	*10,841*	*9,179*	*7,810*	.....	*3,609*	*2,010*	*1,164*	*849*
16	Danville, Ill.	403	287	306	255	217	155	124	93	.....	61	34	37	15
		405	*274*	*275*	*235*	*214*	*171*	*164*	*114*	.....	*80*	*58*	*40*	*30*
17	Decatur, Ill.	320	296	285	311	243	201	150	.....	.....	104	53	57	37
		299	*292*	*295*	*321*	*258*	*243*	*201*	.....	.....	*123*	*79*	*69*	*57*
18	Joliet, Ill.	439	364	292	293	297	228	232	176	.....	.....	.....	.....	.....
		411	*309*	*301*	*270*	*255*	*258*	*228*	*195*	.....	.....	.....	.....	.....
19	Quincy, Ill.	354	260	304	243	184	149	139	85	.....	61	46	29	23
		311	*245*	*241*	*208*	*188*	*155*	*135*	*119*	.....	*109*	*51*	*52*	*44*

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20	Rockford, Ill.	497	429	389	407	357	294	227	150	.....	123	105	86	48
		431	*373*	*378*	*387*	*374*	*330*	*268*	*170*	.....	*159*	*100*	*101*	*65*
21	Springfield, Ill.	538	415	416	404	347	271	214	150	.....	155	77	39	36
		449	*415*	*396*	*401*	*286*	*269*	*209*	*189*	.....	*195*	*101*	*88*	*45*
22	Anderson, Ind.	395	206	235	191	187	105	91	59	.....	82	45	41	39
		347	*290*	*197*	*158*	*193*	*118*	*105*	*80*	.....	*91*	*49*	*46*	*42*
23	Fort Wayne, Ind.	437	333	295	327	323	247	196	169	.....	125	75	32	17
		421	*339*	*321*	*359*	*300*	*270*	*226*	*208*	.....	*139*	*83*	*49*	*34*
24	Indianapolis, Ind.	2,176	1,744	1,758	1,539	1,496	1,155	998	772	.....	499	302	251	104
		1,942	*1,433*	*1,623*	*1,587*	*1,510*	*1,289*	*1,022*	*777*	.....	*489*	*423*	*374*	*215*
25	Marion, Ind.	232	200	199	188	217	154	131	120	.....	61	42	24	19
		197	*177*	*205*	*184*	*188*	*177*	*145*	*135*	.....	*96*	*60*	*32*	*23*
26	Muncie, Ind.	347	217	211	194	169	165	95	70	.....	.....	.....	.....	.....
		324	*257*	*200*	*218*	*180*	*153*	*153*	*98*	.....	.....	.....	.....	.....
27	Terre Haute, Ind.	936	523	551	451	413	336	233	190	.....	132	82	61	38
		835	*465*	*520*	*432*	*406*	*342*	*269*	*220*	.....	*136*	*94*	*60*	*80*
28	Burlington, Iowa.	318	222	200	212	188	159	112	81	.....	67	32	14	14
		285	*215*	*201*	*250*	*201*	*186*	*150*	*114*	.....	*85*	*50*	*34*	*25*
29	Council Bluffs, Iowa.	419	320	306	315	255	244	145	165	.....	66	47	22	26
		358	*263*	*360*	*306*	*244*	*273*	*193*	*161*	.....	*102*	*56*	*43*	*41*
30	Des Moines, Iowa.	1,028	799	720	688	566	477	425	312	.....	252	207	145	128
		893	*751*	*673*	*712*	*588*	*452*	*470*	*365*	.....	*303*	*253*	*168*	*151*
31	Dubuque, Iowa.	173	189	174	168	178	174	104	110	.....	83	41	26	27
		151	*154*	*182*	*180*	*152*	*154*	*129*	*116*	.....	*90*	*44*	*51*	*41*
32	Kansas City, Kans.	959	660	580	574	468	375	296	216	.....	176	85	67	51
		934	*587*	*606*	*592*	*430*	*429*	*368*	*339*	.....	*291*	*157*	*128*	*100*
33	Topeka, Kans.	417	376	362	366	319	255	237	206	.....	160	136	70	62
		450	*304*	*345*	*327*	*275*	*283*	*235*	*227*	.....	*176*	*146*	*110*	*107*
34	Wichita, Kans.	563	330	354	364	316	262	206	164	.....	124	49	31	30
		527	*325*	*367*	*384*	*340*	*350*	*245*	*227*	.....	*150*	*102*	*73*	*47*
35	Covington, Ky.	288	293	235	240	175	179	117	67	.....	56	26	31	14
		253	*239*	*250*	*238*	*192*	*182*	*147*	*90*	.....	*91*	*23*	*27*	*9*
36	Louisville, Ky.	2,339	1,648	1,601	1,501	1,303	1,023	812	655	.....	397	273	167	114
		2,044	*1,518*	*1,548*	*1,448*	*1,252*	*1,244*	*923*	*858*	.....	*529*	*320*	*270*	*176*
37	Lewiston, Me.	119	115	108	103	82	92	74	57	69	55	24	33	20
		115	*102*	*94*	*88*	*98*	*77*	*68*	*59*	*65*	*49*	*32*	*38*	*24*
38	Brockton, Mass.	458	477	488	456	483	426	422	312	214	189	99	91	71
		396	*427*	*457*	*452*	*466*	*424*	*414*	*295*	*262*	*224*	*142*	*108*	*91*
39	Everett, Mass.	372	316	329	345	368	342	288	242	175	85	66	48	32
		406	*333*	*330*	*340*	*331*	*328*	*317*	*273*	*224*	*124*	*83*	*61*	*39*
40	Fall River, Mass.	1,535	1,027	995	986	714	568	376	289	183	151	96	83	47
		1,431	*941*	*945*	*825*	*710*	*497*	*405*	*242*	*212*	*145*	*113*	*81*	*73*
41	Fitchburg, Mass.	289	252	256	214	169	153	176	121	.....	140	83	40	41
		250	*235*	*248*	*243*	*179*	*165*	*164*	*149*	.....	*115*	*88*	*80*	*43*
42	Haverhill, Mass.	359	274	297	240	306	253	168	205	186	106	83	52	49
		301	*264*	*242*	*291*	*249*	*280*	*245*	*232*	*192*	*123*	*72*	*64*	*72*
43	Holyoke, Mass.	365	356	328	324	330	236	198	171	165	162	72	55	27
		343	*265*	*314*	*351*	*300*	*295*	*209*	*156*	*154*	*141*	*106*	*71*	*56*

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TABLE 1.—*Grade populations of certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Elementary school grades.									High school years.			
		1	2	3	4	5	6	7	8	9	1	2	3	4
44	Lowell, Mass.	865	797	591	600	567	461	399	317	258	186	147	110	68
		828	*648*	*553*	*588*	*518*	*489*	*365*	*325*	*289*	*196*	*163*	*153*	*93*
45	Malden, Mass.	491	369	370	373	365	308	284	243	196	164	93	69	47
		512	*329*	*341*	*384*	*372*	*308*	*291*	*210*	*236*	*165*	*130*	*106*	*69*
46	New Bedford, Mass.	956	822	766	624	538	461	298	185	127	100	58	42	24
		943	*763*	*685*	*678*	*545*	*469*	*340*	*217*	*135*	*106*	*82*	*57*	*50*
47	Newton, Mass.	359	287	275	307	270	242	285	201	165	136	140	93	67
		300	*285*	*319*	*272*	*285*	*229*	*243*	*244*	*197*	*154*	*94*	*115*	*100*
48	Pittsfield, Mass.	314	259	265	276	250	205	178	137	95	73	59	28	30
		294	*267*	*271*	*237*	*224*	*199*	*195*	*117*	*105*	*95*	*84*	*41*	*20*
49	Quincy, Mass.	475	401	368	244	356	419	294	239	.....	175	97	62	47
		478	*367*	*336*	*226*	*332*	*415*	*280*	*215*	.....	*164*	*98*	*62*	*55*
50	Somerville, Mass.	732	672	624	667	642	582	516	437	359	247	198	119	94
		668	*625*	*630*	*556*	*590*	*566*	*545*	*408*	*384*	*320*	*242*	*185*	*177*
51	Taunton, Mass.	362	303	261	243	202	211	146	143	107	65	33	27	20
		331	*252*	*268*	*224*	*224*	*209*	*166*	*152*	*118*	*88*	*71*	*42*	*31*
52	Waltham, Mass.	151	155	112	129	127	129	146	122	80	76	55	34	29
		140	*141*	*128*	*158*	*128*	*145*	*129*	*106*	*104*	*100*	*67*	*45*	*49*
53	Worcester, Mass.	1,272	1,093	1,014	1,025	971	837	774	630	478	315	222	155	124
		1,041	*1,087*	*1,001*	*906*	*941*	*815*	*697*	*598*	*486*	*340*	*307*	*149*	*158*
54	Battle Creek, Mich.	205	176	197	200	174	136	136	80	.....	100	44	35	16
		198	*170*	*221*	*166*	*158*	*168*	*156*	*116*	.....	*131*	*48*	*58*	*58*
55	Bay City, Mich.	598	383	320	276	302	266	201	152	.....	138	71	42	38
		515	*329*	*261*	*270*	*242*	*277*	*195*	*201*	.....	*141*	*82*	*68*	*48*
56	Calumet, Mich.	372	372	303	362	314	252	206	111	.....	53	47	29	32
		364	*320*	*321*	*328*	*246*	*222*	*215*	*144*	.....	*74*	*90*	*43*	*48*
57	Detroit, Mich.	3,535	2,781	2,791	2,534	2,333	1,858	1,533	1,021	.....	689	414	347	237
		3,230	*2,423*	*2,618*	*2,411*	*2,283*	*1,802*	*1,503*	*1,122*	.....	*729*	*508*	*362*	*293*
58	Grand Rapids, Mich.	1,049	723	728	664	656	508	460	425	.....	270	217	91	87
		1,021	*705*	*682*	*626*	*581*	*567*	*482*	*398*	.....	*253*	*273*	*113*	*114*
59	Kalamazoo, Mich.	317	264	285	236	262	228	188	170	125	71	48	36	.....
		305	*257*	*262*	*255*	*211*	*217*	*225*	*195*	*141*	*101*	*57*	*51*	.....
60	Saginaw, Mich.	245	233	213	196	192	199	202	154	.....	149	82	48	39
		241	*212*	*211*	*203*	*208*	*195*	*201*	*148*	.....	*144*	*99*	*53*	*57*
61	Saginaw (west side), Mich.	170	175	166	153	155	138	120	106	.....	65	32	10	9
		173	*149*	*139*	*139*	*152*	*118*	*128*	*107*	.....	*67*	*38*	*30*	*19*
62	Duluth, Minn.	957	665	686	640	681	554	377	291	.....	152	101	59	53
		847	*570*	*685*	*632*	*588*	*538*	*419*	*387*	.....	*202*	*121*	*100*	*71*
63	Minneapolis, Minn.	3,153	2,260	2,148	2,242	2,244	1,944	1,667	1,269	.....	838	586	335	251
		2,963	*2,069*	*2,035*	*2,190*	*2,127*	*1,956*	*1,840*	*1,631*	.....	*1,088*	*831*	*456*	*412*

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64	St. Joseph, Mo.	868	649	645	589	488	431	290	242	.....	201	97	53	40
		781	*578*	*600*	*591*	*515*	*466*	*396*	*273*	.....	*210*	*154*	*64*	*70*
65	St. Louis, Mo.	5,534	4,798	4,710	4,564	3,653	2,679	2,084	1,479	.....	722	409	273	159
		5,841	*4,742*	*4,491*	*4,297*	*3,636*	*2,883*	*2,292*	*1,900*	.....	*1,065*	*713*	*457*	*337*
66	Butte, Mont.	515	345	309	322	303	298	220	150	.....	.....	.....	.....	.....
		500	*343*	*345*	*348*	*317*	*280*	*268*	*167*	.....	.....	.....	.....	.....
67	East Orange, N. J.	352	309	299	256	223	146	168	120	.....	130	63	41	29
		303	*272*	*284*	*258*	*203*	*208*	*154*	*149*	.....	*143*	*84*	*51*	*30*
68	Hoboken, N. J.	828	627	607	517	419	314	253	161	.....	66	36	17	12
		787	*622*	*518*	*532*	*384*	*323*	*214*	*122*	.....	*85*	*36*	*11*	*11*
69	New Brunswick, N. J.	147	160	160	128	138	92	84	55	.....	76	46	25	17
		170	*123*	*159*	*142*	*106*	*72*	*84*	*79*	.....	*79*	*38*	*43*	*26*
70	Orange, N. J.	546	186	182	185	174	91	84	59	.....	42	22	12	8
		405	*214*	*185*	*184*	*166*	*118*	*68*	*48*	.....	*28*	*31*	*33*	*14*
71	Paterson, N. J.	1,299	1,177	1,080	976	936	724	506	381	.....	215	146	94	22
		1,152	*1,085*	*1,052*	*967*	*919*	*715*	*539*	*403*	.....	*327*	*185*	*111*	*69*
72	Passaic, N. J.	554	453	444	374	278	132	119	107	.....	66	48	20	18
		581	*427*	*349*	*330*	*259*	*170*	*117*	*82*	.....	*67*	*49*	*20*	*23*
73	Perth Amboy, N. J.	612	316	249	245	225	148	126	70	.....	55	33	30	19
		631	*284*	*243*	*237*	*190*	*133*	*118*	*97*	.....	*40*	*39*	*32*	*23*
74	Trenton, N. J.	1,001	779	750	630	496	354	255	171	.....	124	70	62	32
		994	*696*	*733*	*568*	*537*	*423*	*289*	*265*	.....	*187*	*107*	*100*	*45*
75	Albany, N. Y.	768	579	600	699	596	425	407	292	.....	180	101	80	65
		700	*498*	*457*	*645*	*557*	*474*	*406*	*313*	.....	*192*	*165*	*124*	*82*
76	Auburn, N. Y.	264	201	205	227	187	178	148	91	.....	124	53	25	34
		243	*181*	*194*	*192*	*196*	*186*	*133*	*111*	.....	*118*	*59*	*13*	*37*
77	Elmira, N. Y.	356	258	237	257	234	209	147	124	.....	96	71	63	46
		304	*217*	*193*	*231*	*237*	*207*	*187*	*132*	.....	*135*	*83*	*82*	*65*
78	Jamestown, N. Y.	267	225	284	267	253	213	201	122	87	69	40	29	18
		208	*217*	*241*	*254*	*247*	*212*	*172*	*139*	*114*	*96*	*47*	*45*	*40*
79	Kingston, N. Y.	373	189	203	249	200	158	123	96	.....	155	39	33	15
		329	*188*	*217*	*214*	*176*	*164*	*138*	*125*	.....	*145*	*37*	*40*	*28*
80	Newburgh, N. Y.	270	193	206	194	199	182	111	86	.....	77	53	28	19
		250	*189*	*209*	*198*	*172*	*167*	*143*	*109*	.....	*90*	*59*	*30*	*30*
81	Niagara Falls, N. Y.	251	244	208	217	196	149	157	91	.....	139	37	36	17
		264	*203*	*191*	*207*	*176*	*149*	*122*	*92*	.....	*162*	*57*	*43*	*37*
82	Poughkeepsie, N. Y.	204	156	167	139	165	122	135	125	.....	102	34	33	14
		210	*158*	*147*	*160*	*152*	*99*	*117*	*172*	.....	*109*	*59*	*36*	*41*
83	Rochester, N. Y.	1,417	1,231	1,284	1,051	1,050	949	739	585	.....	.....	.....	.....	.....
		1,274	*1,084*	*1,103*	*1,092*	*1,114*	*963*	*795*	*667*	.....	.....	.....	.....	.....
84	Schenectady, N. Y.	978	646	669	625	564	407	269	207	.....	103	101	62	47
		868	*598*	*562*	*640*	*517*	*424*	*293*	*208*	.....	*114*	*109*	*52*	*62*
85	Syracuse, N. Y.	1,175	1,003	998	933	828	754	631	471	.....	463	212	96	59
		998	*954*	*943*	*967*	*893*	*767*	*667*	*489*	.....	*479*	*230*	*166*	*116*
86	Troy, N. Y.	544	311	287	466	294	250	160	117	.....	72	75	51	32
		491	*280*	*286*	*363*	*290*	*218*	*175*	*138*	.....	*80*	*85*	*59*	*48*
87	Utica, N. Y.	643	520	526	480	418	388	396	245	.....	162	67	57	32
		567	*475*	*480*	*399*	*352*	*340*	*447*	*240*	.....	*262*	*78*	*90*	*42*
88	Watertown, N. Y.	338	280	270	304	232	208	145	125	.....	78	62	42	31
		338	*217*	*269*	*155*	*233*	*188*	*170*	*122*	.....	*101*	*88*	*56*	*40*
89	Yonkers, N. Y.	1,377	848	750	625	497	431	265	230	.....	204	118	82	38
		1,388	*737*	*662*	*611*	*516*	*457*	*294*	*224*	.....	*264*	*118*	*83*	*53*

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TABLE 1.—*Grade populations of certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Elementary school grades.									High school years.			
		1	2	3	4	5	6	7	8	9	1	2	3	4
90	Akron, Ohio	575	494	474	504	459	436	439	335	.....	262	126	69	36
		547	*508*	*478*	*515*	*428*	*414*	*416*	*308*	.....	*238*	*124*	*165*	*114*
91	Canton, Ohio	472	441	359	346	323	297	243	205	.....	157	94	55	41
		451	*408*	*369*	*345*	*324*	*309*	*250*	*174*	.....	*183*	*104*	*54*	*73*
92	Columbus, Ohio	1,907	1,226	1,451	1,429	1,220	942	743	603	.....	522	327	223	161
		1,775	*1,210*	*1,405*	*1,450*	*1,283*	*1,017*	*781*	*708*	.....	*610*	*379*	*238*	*196*
93	Dayton, Ohio	825	775	768	676	712	599	425	309	.....	289	127	100	86
		744	*743*	*706*	*762*	*662*	*542*	*424*	*358*	.....	*278*	*190*	*149*	*126*
94	Hamilton, Ohio	370	318	302	264	271	203	152	96	.....	80	51	33	29
		308	*258*	*304*	*250*	*246*	*201*	*133*	*99*	.....	*70*	*40*	*49*	*30*
95	Springfield, Ohio	406	395	378	373	388	301	242	183	.....	149	76	39	22
		355	*341*	*348*	*313*	*319*	*285*	*259*	*199*	.....	*158*	*118*	*66*	*59*
96	Toledo, Ohio	1,493	1,252	1,209	1,251	1,229	927	736	524	.....	450	192	98	75
		1,421	*1,145*	*1,114*	*1,145*	*985*	*910*	*731*	*588*	.....	*450*	*255*	*154*	*116*
97	Youngstown, Ohio	902	549	429	515	479	356	257	216	.....	.....	.....	.....	.....
		914	*549*	*466*	*461*	*368*	*358*	*274*	*213*	.....	.....	.....	.....	.....
98	Allentown, Pa	576	436	412	457	421	435	259	172	.....	82	56	28	24
		541	*423*	*416*	*425*	*479*	*348*	*250*	*162*	.....	*114*	*67*	*52*	*19*
99	Altoona, Pa	539	438	418	446	387	341	270	213	.....	135	72	53	52
		524	*495*	*415*	*486*	*430*	*371*	*245*	*193*	.....	*135*	*81*	*65*	*69*
100	Easton, Pa	303	264	298	292	260	186	103	77	.....	63	40	38	31
		288	*258*	*276*	*268*	*250*	*223*	*100*	*83*	.....	*82*	*43*	*50*	*33*
101	Erie, Pa	621	603	724	410	331	182	75	.....	.....	145	96	70	31
		548	*600*	*614*	*401*	*347*	*209*	*118*	.....	.....	*143*	*123*	*72*	*69*
102	Harrisburg, Pa	643	513	415	573	493	376	266	250	180	155	139	79	35
		606	*505*	*424*	*617*	*445*	*341*	*278*	*251*	*187*	*142*	*139*	*50*	*72*
103	Lancaster, Pa	373	388	338	331	340	271	218	151	.....	105	72	37	15
		332	*358*	*325*	*330*	*257*	*252*	*214*	*179*	.....	*135*	*67*	*64*	*45*
104	Newcastle, Pa	407	319	341	341	231	243	177	136	.....	86	40	31	14
		388	*335*	*294*	*320*	*276*	*262*	*204*	*153*	.....	*140*	*86*	*70*	*20*
105	Norristown, Pa	269	183	200	132	166	140	128	88	.....	89	63	31	15
		213	*161*	*180*	*191*	*168*	*142*	*121*	*75*	.....	*76*	*76*	*47*	*41*
106	Philadelphia, Pa	13,756	11,661	10,906	9,033	7,437	5,702	3,683	3,002	.....	1,776	1,351	872	237
		12,985	*11,068*	*10,952*	*9,310*	*7,564*	*6,225*	*4,186*	*3,200*	.....	*1,572*	*1,055*	*750*	*515*
107	Pittsburg, Pa	4,825	3,573	3,185	2,717	2,206	1,829	1,357	891	.....	536	329	160	80
		4,521	*3,352*	*3,042*	*2,682*	*2,226*	*1,776*	*1,417*	*963*	.....	*608*	*371*	*151*	*88*
108	Reading, Pa	735	749	607	753	728	480	272	219	.....	196	138	108	41
		821	*707*	*679*	*748*	*533*	*486*	*319*	*241*	.....	*190*	*127*	*118*	*57*
109	Wilkes-Barre, Pa	983	543	497	490	450	369	281	239	.....	172	117	83	79
		800	*514*	*472*	*482*	*398*	*403*	*300*	*264*	.....	*195*	*116*	*82*	*76*

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110	Williamsport, Pa.	357	296	317	375	298	240	207	128	104	121	53	31	18
		388	*277*	*295*	*336*	*325*	*253*	*210*	*171*	*142*	*126*	*82*	*34*	*42*
111	York, Pa.	428	391	407	369	283	310	239	175	.....	117	88	51	29
		419	*371*	*375*	*400*	*351*	*303*	*236*	*143*	.....	*144*	*72*	*50*	*43*
112	Newport, R. I.	211	224	211	170	181	162	139	126	124	73	40	26	15
		286	*169*	*162*	*174*	*195*	*147*	*150*	*144*	*108*	*82*	*51*	*33*	*26*
113	Providence, R. I.	2,010	1,639	1,688	1,632	1,519	1,246	975	715	.....	442	242	199	141
		1,989	*1,547*	*1,695*	*1,569*	*1,362*	*1,306*	*968*	*838*	.....	*560*	*350*	*231*	*162*
114	Warwick, R. I.	377	208	208	171	171	150	77	64	54	54	29	19	10
		328	*199*	*228*	*192*	*156*	*117*	*72*	*77*	*68*	*39*	*33*	*26*	*28*
115	Woonsocket, R. I.	408	273	236	211	168	130	96	68	49	45	22	11	9
		359	*217*	*245*	*198*	*182*	*119*	*93*	*77*	*52*	*47*	*21*	*18*	*26*
116	Columbia, S. C.	220	119	96	87	71	47	36	.....	.....	37	29	9	.....
		222	*98*	*111*	*107*	*98*	*71*	*66*	.....	.....	*65*	*25*	*16*	.....
117	Nashville, Tenn.	1,444	1,092	1,048	894	695	553	369	280	.....	174	91	69	.....
		1,343	*1,034*	*1,102*	*1,111*	*812*	*669*	*567*	*351*	.....	*293*	*140*	*109*	.....
118	Dallas, Tex.	910	656	577	534	425	307	244	115	.....	126	102	48	29
		934	*647*	*647*	*589*	*512*	*467*	*359*	*216*	.....	*266*	*135*	*76*	*61*
119	Galveston, Tex.	400	301	293	224	144	93	77	31	.....	35	22	7	11
		358	*298*	*283*	*254*	*183*	*144*	*135*	*61*	.....	*68*	*46*	*26*	*19*
120	Houston, Tex.	797	736	613	537	331	218	240	.....	.....	103	85	40	20
		854	*704*	*661*	*526*	*324*	*223*	*139*	.....	.....	*187*	*82*	*86*	*47*
121	San Antonio, Tex.	1,305	747	647	606	388	274	188	147	.....	138	51	57	.....
		1,077	*754*	*643*	*595*	*479*	*358*	*268*	*215*	.....	*167*	*91*	*67*	.....
122	Salt Lake City, Utah	1,433	959	1,165	1,082	870	601	454	454	.....	225	133	94	61
		1,301	*884*	*912*	*904*	*742*	*719*	*595*	*529*	.....	*255*	*180*	*93*	*80*
123	Lynchburg, Va.	428	322	217	204	152	139	102	.....	.....	66	42	26	9
		336	*274*	*202*	*232*	*157*	*143*	*104*	.....	.....	*79*	*69*	*48*	*26*
124	Seattle, Wash.	1,874	1,484	1,321	1,554	1,401	1,219	1,112	801	.....	716	381	226	147
		1,550	*1,314*	*1,277*	*1,491*	*1,364*	*1,299*	*1,081*	*913*	.....	*772*	*492*	*267*	*191*
125	Spokane, Wash.	1,004	777	727	730	716	633	484	362	.....	268	179	108	78
		936	*725*	*680*	*704*	*653*	*585*	*543*	*450*	.....	*342*	*211*	*150*	*119*
126	Tacoma, Wash.	808	634	543	579	577	583	450	396	.....	273	145	102	83
		710	*587*	*482*	*526*	*530*	*524*	*455*	*376*	.....	*270*	*196*	*144*	*96*
127	Green Bay, Wis.	482	171	171	171	137	126	104	92	.....	109	99	44	37
		509	*185*	*163*	*174*	*116*	*107*	*105*	*112*	.....	*128*	*57*	*52*	*41*
128	La Crosse, Wis.	364	293	266	260	211	213	134	113	.....	96	51	33	14
		335	*260*	*254*	*219*	*214*	*202*	*170*	*109*	.....	*85*	*50*	*52*	*29*
129	Madison, Wis.	223	179	202	166	163	144	126	86	.....	86	71	71	41
		173	*167*	*184*	*204*	*160*	*159*	*131*	*109*	.....	*109*	*73*	*90*	*55*
130	Racine, Wis.	313	295	315	297	310	281	238	166	.....	113	57	40	7
		285	*260*	*217*	*288*	*258*	*241*	*219*	*189*	.....	*117*	*82*	*40*	*32*
131	Sheboygan, Wis.	228	187	191	176	165	138	127	100	.....	58	36	43	14
		219	*181*	*161*	*146*	*141*	*119*	*117*	*101*	.....	*55*	*52*	*47*	*21*
132	Superior, Wis.	371	359	245	169	272	227	180	168	.....	116	58	35	30
		328	*293*	*228*	*265*	*257*	*236*	*168*	*161*	.....	*118*	*64*	*53*	*47*

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TABLE 2.—*Grade populations of certain cities of less than 25,000 population.*

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Elementary school grades.									High school years.			
		1	2	3	4	5	6	7	8	9	1	2	3	4
1	Fort Smith, Ark	288	178	223	234	153	122	103	99	.....	57	37	27	11
		245	*217*	*181*	*199*	*152*	*152*	*129*	*102*	.....	*83*	*48*	*49*	*49*
2	Hot Springs, Ark	379	184	170	133	100	76	61	.....	.....	65	22	11	7
		422	*170*	*192*	*172*	*123*	*104*	*95*	.....	.....	*86*	*18*	*30*	*10*
3	Alameda, Cal	219	181	206	176	199	177	160	122	.....	71	45	20	26
		193	*165*	*192*	*199*	*176*	*178*	*203*	*136*	.....	*119*	*78*	*32*	*32*
4	Fresno, Cal	407	283	235	250	176	129	156	91	.....	103	66	32	19
		381	*244*	*228*	*207*	*148*	*156*	*170*	*119*	.....	*104*	*81*	*44*	*25*
5	Pasadena, Cal	274	253	233	234	264	229	205	133	.....	103	68	77	52
		228	*212*	*248*	*238*	*237*	*228*	*220*	*179*	.....	*159*	*123*	*66*	*69*
6	Riverside, Cal	151	110	95	122	162	127	106	81	.....	137	44	39	34
		135	*97*	*109*	*124*	*135*	*115*	*114*	*93*	.....	*80*	*54*	*45*	*35*
7	Santa Barbara, Cal	97	65	74	72	65	72	57	41	.....	54	24	19	12
		68	*64*	*75*	*78*	*80*	*68*	*32*	*67*	.....	*81*	*38*	*16*	*17*
8	Santa Cruz, Cal	126	95	82	77	87	76	56	48	.....	32	26	17	9
		114	*87*	*83*	*83*	*88*	*78*	*89*	*59*	.....	*50*	*23*	*29*	*24*
9	Stockton, Cal	161	142	165	187	148	150	139	94	.....	62	29	38	10
		152	*121*	*120*	*145*	*154*	*146*	*116*	*65*	.....	*80*	*67*	*45*	*32*
10	Vallejo, Cal	93	82	94	73	80	66	44	21	.....	8	12	11	11
		73	*51*	*89*	*74*	*71*	*71*	*42*	*33*	.....	*30*	*14*	*22*	*13*
11	Canon City, Colo	58	60	63	67	65	43	45	25	.....	12	15	15	12
		44	*37*	*49*	*50*	*49*	*37*	*48*	*29*	.....	*38*	*19*	*16*	*12*
12	Grand Junction, Colo	139	95	91	99	73	80	72	30	.....	67	22	19	14
		97	*90*	*75*	*90*	*68*	*81*	*67*	*50*	.....	*66*	*27*	*22*	*18*
13	Ansonia, Conn	216	185	159	198	157	137	92	78	.....	.....	.....	.....	.....
		196	*186*	*173*	*150*	*149*	*125*	*105*	*77*	.....	.....	.....	.....	.....
14	Danbury, Conn	165	211	173	198	162	130	82	61	.....	69	35	20	.....
		152	*179*	*162*	*190*	*117*	*115*	*94*	*57*	.....	*80*	*56*	*24*	.....
15	Middletown, Conn	82	82	92	93	79	60	61	45	24	70	54	43	30
		68	*67*	*68*	*48*	*61*	*60*	*54*	*50*	*34*	*67*	*52*	*33*	*47*
16	Naugatuck, Conn	152	128	122	132	107	67	50	46	47	28	22	20	9
		159	*109*	*133*	*125*	*118*	*58*	*49*	*41*	*41*	*40*	*17*	*19*	*11*
17	Torrington, Conn	144	115	107	100	113	73	75	36	.....	30	28	17	10
		140	*129*	*77*	*111*	*101*	*74*	*76*	*47*	.....	*31*	*28*	*20*	*11*
18	Wallingford, Conn	167	151	113	127	119	87	70	79	.....	27	18	14	8
		150	*131*	*105*	*104*	*104*	*95*	*54*	*121*	.....	*39*	*32*	*16*	*20*
19	Pensacola, Fla	403	218	192	149	105	47	43	24	.....	11	12	6	.....
		410	*296*	*223*	*208*	*114*	*104*	*71*	*46*	.....	*49*	*15*	*7*	*10*

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20	Athens, Ga.	123	100	117	88	60	49	34	.....	.....	31	23	21	.....
		92	*93*	*84*	*101*	*81*	*79*	*58*	.....	.....	*35*	*18*	*13*	*4*
21	Columbus, Ga.	393	210	233	165	120	93	63	.....	.....	56	32	12	7
		322	*273*	*231*	*201*	*154*	*99*	*22*	.....	.....	*80*	*54*	*21*	*8*
22	Dalton, Ga.	114	82	66	60	52	36	33	2	.....	13	10	.....	.....
		96	*88*	*83*	*67*	*39*	*44*	*46*	*5*	.....	*22*	*16*	.....	.....
23	Lagrange, Ga.	142	90	65	76	30	28	23	.....	.....	13	7	5	.....
		111	*94*	*78*	*81*	*45*	*56*	*38*	.....	.....	*21*	*8*	*2*	.....
24	Pocatello, Idaho	88	72	55	67	65	49	34	27	.....	16	2	9	2
		82	*78*	*63*	*65*	*80*	*42*	*29*	*53*	.....	*15*	*12*	*5*	*2*
25	Alton, Ill.	186	133	118	121	117	114	74	73	.....	40	24	22	16
		142	*143*	*128*	*123*	*129*	*119*	*86*	*83*	.....	*74*	*54*	*26*	*42*
26	Belleville, Ill.	223	183	222	153	170	111	120	92	.....	42	22	23	.....
		231	*151*	*162*	*186*	*172*	*140*	*98*	*71*	.....	*33*	*29*	*25*	.....
27	Canton, Ill.	122	115	159	118	85	73	53	44	.....	51	13	15	10
		118	*106*	*96*	*108*	*94*	*71*	*63*	*53*	.....	*51*	*23*	*29*	*20*
28	Centralia, Ill.	135	103	96	103	101	65	70	45	.....	.....	.....	.....	.....
		124	*113*	*81*	*97*	*97*	*84*	*67*	*65*	.....	.....	.....	.....	.....
29	Champaign, Ill.	141	86	105	80	90	91	62	39	.....	.....	.....	.....	.....
		122	*90*	*92*	*108*	*100*	*95*	*61*	*47*	.....	.....	.....	.....	.....
30	Chicago Heights, Ill.	202	123	134	83	60	42	53	42	.....	.....	.....	.....	.....
		179	*106*	*102*	*56*	*60*	*48*	*41*	*54*	.....	.....	.....	.....	.....
31	Clinton, Ill.	89	70	63	56	74	50	39	34	.....	28	21	14	13
		75	*75*	*69*	*55*	*46*	*55*	*44*	*44*	.....	*41*	*30*	*11*	*27*
32	De Kalb, Ill	113	78	88	58	58	70	60	50	.....	.....	.....	.....	.....
		99	*71*	*83*	*62*	*66*	*67*	*66*	*67*	.....	.....	.....	.....	.....
33	Evanston, Ill., Dist. 76.	99	56	91	48	67	46	66	29	.....	.....	.....	.....	.....
		74	*63*	*94*	*55*	*50*	*40*	*50*	*39*	.....	.....	.....	.....	.....
34	Evanston, Ill., Dist. 75.	206	129	155	120	115	95	100	81	.....	.....	.....	.....	.....
		155	*127*	*128*	*106*	*97*	*117*	*87*	*74*	.....	.....	.....	.....	.....
35	Freeport, Ill.	208	136	153	161	137	102	90	72	.....	52	36	26	15
		199	*90*	*163*	*148*	*142*	*111*	*101*	*86*	.....	*62*	*62*	*40*	*48*
36	Galesburg, Ill.	233	155	193	175	156	173	130	108	.....	106	72	54	42
		215	*175*	*182*	*153*	*169*	*157*	*153*	*114*	.....	*130*	*108*	*131*	*54*
37	Jacksonville, Ill.	120	107	132	113	121	80	66	62	.....	39	26	26	16
		116	*138*	*100*	*122*	*115*	*109*	*94*	*43*	.....	*68*	*38*	*44*	*36*
38	Kankakee, Ill.	130	126	117	116	104	92	83	52	.....	32	18	16	10
		152	*105*	*70*	*117*	*96*	*90*	*102*	*72*	.....	*46*	*28*	*22*	*13*
39	La Salle, Ill.	118	99	75	63	47	38	41	38	.....	.....	.....	.....	.....
		101	*92*	*84*	*49*	*51*	*44*	*43*	*35*	.....	.....	.....	.....	.....
40	Macomb, Ill.	68	45	59	53	45	41	26	20	.....	19	9	7	12
		60	*54*	*40*	*54*	*38*	*45*	*31*	*27*	.....	*27*	*28*	*19*	*10*
41	Mattoon, Ill.	196	142	149	121	118	84	88	38	.....	29	22	16	10
		172	*132*	*123*	*131*	*129*	*87*	*79*	*55*	.....	*46*	*29*	*15*	*12*
42	Maywood and Melrose Park, Ill	156	127	161	124	113	78	81	55	.....	33	14	9	3
		138	*131*	*108*	*108*	*110*	*82*	*63*	*64*	.....	*24*	*22*	*13*	*2*
43	Moline, Ill.	197	181	185	148	189	165	144	88	.....	61	29	26	25
		174	*156*	*193*	*147*	*159*	*140*	*149*	*90*	.....	*50*	*45*	*29*	*39*
44	Ottawa, Ill.	115	85	81	97	76	76	65	62	.....	.....	.....	.....	.....
		103	*85*	*85*	*89*	*88*	*73*	*77*	*66*	.....	.....	.....	.....	.....
45	Pekin, Ill.	151	104	102	85	87	69	57	44	.....	40	20	12	7
		136	*95*	*96*	*111*	*86*	*66*	*73*	*42*	.....	*33*	*25*	*26*	*18*

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TABLE 2.—*Grade populations of certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Elementary school grades.									High school years.			
		1	2	3	4	5	6	7	8	9	1	2	3	4
46	Rock Island, Ill.	241	192	186	185	163	162	125	111	.....	56	49	38	32
		196	*199*	*188*	*179*	*175*	*179*	*141*	*123*	.....	*68*	*44*	*49*	*48*
47	Streator, Ill.	259	132	165	135	136	96	57	.....	.....	.....	.....	.....	.....
		242	*140*	*136*	*120*	*110*	*96*	*64*	*57*	.....	.....	.....	.....	.....
48	Waukegan, Ill.	163	132	108	112	90	94	65	77	.....	.....	.....	.....	.....
		148	*106*	*94*	*130*	*89*	*107*	*80*	*79*	.....	.....	.....	.....	.....
49	Alexandria, Ind.	63	44	54	47	46	26	21	20	.....	.....	.....	.....	.....
		58	*53*	*56*	*42*	*44*	*47*	*41*	*31*	.....	.....	.....	.....	.....
50	Bedford, Ind.	142	95	112	75	79	89	77	42	.....	.....	.....	.....	.....
		137	*63*	*88*	*79*	*80*	*59*	*71*	*48*	.....	.....	.....	.....	.....
51	Connersville, Ind.	74	67	57	60	46	44	31	36	.....	24	14	12	16
		74	*79*	*71*	*57*	*54*	*56*	*47*	*39*	.....	*29*	*37*	*18*	*12*
52	Crawfordsville, Ind.	100	82	90	68	70	57	60	49	.....	57	29	29	16
		94	*71*	*94*	*61*	*69*	*81*	*56*	*43*	.....	*70*	*27*	*30*	*28*
53	East Chicago, Ind.	176	113	111	126	59	46	41	29	.....	29	8	5	2
		57	*76*	*92*	*119*	*63*	*65*	*43*	*20*	.....	*19*	*9*	*3*	*3*
54	Frankfort, Ind.	105	135	105	123	81	85	62	74	.....	57	26	22	25
		107	*100*	*80*	*99*	*86*	*106*	*86*	*71*	.....	*54*	*36*	*14*	*29*
55	Goshen, Ind.	101	84	127	39	72	55	51	32	.....	76	36	22	18
		85	*69*	*74*	*63*	*58*	*70*	*53*	*59*	.....	*67*	*36*	*18*	*22*
56	Kokomo, Ind.	220	150	148	130	138	110	89	60	.....	65	44	33	17
		227	*180*	*152*	*162*	*149*	*134*	*101*	*74*	.....	*62*	*51*	*40*	*34*
57	Laporte, Ind.	69	74	44	71	46	48	39	33	.....	41	22	9	15
		67	*58*	*53*	*68*	*45*	*61*	*40*	*42*	.....	*41*	*29*	*33*	*25*
58	Lebanon, Ind.	70	51	52	59	38	43	39	26	.....	61	35	20	15
		79	*67*	*70*	*54*	*56*	*45*	*31*	*33*	.....	*69*	*28*	*17*	*26*
59	Logansport, Ind.	187	173	164	153	130	133	119	73	.....	50	48	27	15
		145	*151*	*143*	*149*	*118*	*112*	*123*	*84*	.....	*72*	*78*	*39*	*32*
60	Michigan City, Ind.	161	154	116	120	138	83	78	45	.....	60	24	18	.....
		155	*115*	*115*	*127*	*107*	*77*	*82*	*57*	.....	*57*	*20*	*13*	.....
61	Peru, Ind.	151	108	80	120	94	83	63	41	.....	43	27	26	18
		132	*120*	*72*	*92*	*101*	*80*	*70*	*37*	.....	*51*	*46*	*26*	*24*
62	Wabash, Ind.	63	128	77	114	106	72	62	48	.....	36	32	22	26
		69	*71*	*106*	*84*	*84*	*95*	*78*	*66*	.....	*45*	*38*	*41*	*39*
63	Clinton, Iowa.	134	123	170	106	135	134	83	56	.....	51	30	20	9
		130	*123*	*163*	*115*	*127*	*110*	*89*	*73*	.....	*44*	*53*	*37*	*36*
64	Creston, Iowa.	80	71	73	59	84	71	48	39	.....	26	28	10	13
		73	*56*	*59*	*42*	*69*	*64*	*58*	*42*	.....	*50*	*41*	*37*	*14*
65	Iowa City, Iowa.	119	66	67	46	51	58	55	49	.....	.....	.....	.....	.....
		106	*53*	*37*	*34*	*63*	*52*	*50*	*65*	.....	.....	.....	.....	.....

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66	Keokuk, Iowa	182	116	118	103	78	92	67	76	.....	37	21	13	18
		146	*103*	*105*	*95*	*97*	*111*	*65*	*93*	.....	*33*	*32*	*28*	*29*
67	Marshalltown, Iowa	158	131	138	110	110	83	48	68	.....	31	25	18	18
		164	*128*	*155*	*130*	*119*	*109*	*74*	*72*	.....	*57*	*40*	*29*	*27*
68	Mason City, Iowa	111	91	109	87	79	86	58	56	.....	35	29	13	9
		84	*85*	*93*	*77*	*74*	*68*	*72*	*70*	.....	*57*	*36*	*23*	*20*
69	Muscatine, Iowa	121	109	80	116	121	102	79	69	25	36	26	21	13
		95	*89*	*91*	*128*	*100*	*115*	*101*	*84*	*38*	*36*	*22*	*22*	*22*
70	Oskaloosa, Iowa	98	92	78	102	107	80	51	42	.....	37	16	19	7
		87	*92*	*82*	*96*	*75*	*90*	*70*	*52*	.....	*44*	*40*	*21*	*10*
71	Ottumwa, Iowa	484	249	225	188	192	187	143	96	.....	58	51	25	13
		423	*229*	*251*	*182*	*203*	*247*	*161*	*128*	.....	*69*	*77*	*38*	*32*
72	Arkansas City, Kans	115	78	74	83	83	62	49	42	.....	40	16	11	10
		115	*60*	*77*	*65*	*63*	*58*	*44*	*55*	.....	*41*	*38*	*8*	*18*
73	Emporia, Kans	101	77	70	84	95	71	53	36	.....	60	34	14	7
		100	*99*	*112*	*91*	*76*	*98*	*75*	*46*	.....	*64*	*49*	*26*	*14*
74	Hutchinson, Kans	193	140	140	129	139	125	72	56	20	49	28	17	20
		151	*123*	*101*	*131*	*126*	*124*	*105*	*70*	*25*	*74*	*38*	*30*	*13*
75	Parsons, Kans	174	134	88	105	97	71	77	56	.....	34	18	19	6
		170	*122*	*102*	*109*	*87*	*81*	*83*	*66*	.....	*60*	*35*	*19*	*21*
76	Owensboro, Ky	107	98	98	103	90	94	73	61	.....	33	48	14	14
		118	*94*	*90*	*92*	*117*	*75*	*67*	*65*	.....	*63*	*44*	*21*	*29*
77	Shreveport, La	222	129	128	103	85	68	42	35	.....	29	21	4	5
		236	*119*	*139*	*106*	*97*	*73*	*65*	*58*	.....	*41*	*31*	*15*	*8*
78	Bangor, Me	339	177	157	161	125	156	66	151	39	97	42	44	50
		224	*188*	*156*	*111*	*128*	*120*	*148*	*132*	*71*	*96*	*98*	*86*	*43*
79	Waterville, Me	89	74	70	83	59	59	51	39	37	23	14	8	8
		69	*88*	*69*	*50*	*58*	*68*	*58*	*42*	*32*	*30*	*24*	*18*	*13*
80	Cumberland, Md	347	184	222	194	126	63	.....	.....	.....	63	21	13	4
		364	*216*	*232*	*190*	*180*	*105*	.....	.....	.....	*82*	*41*	*16*	*19*
81	Hagerstown, Md	285	154	162	131	107	71	55	.....	.....	.....	.....	.....	.....
		305	*125*	*164*	*104*	*96*	*100*	*62*	.....	.....	.....	.....	.....	.....
82	Adams, Mass	140	131	101	93	96	92	62	39	36	29	28	15	11
		117	*90*	*106*	*114*	*96*	*76*	*68*	*59*	*30*	*28*	*34*	*23*	*17*
83	Attleboro, Mass	234	161	136	145	138	94	83	68	.....	43	29	13	13
		192	*161*	*143*	*120*	*135*	*106*	*86*	*66*	.....	*49*	*31*	*26*	*18*
84	Beverly, Mass	191	155	171	143	178	145	136	108	81	63	38	46	23
		179	*159*	*148*	*157*	*148*	*178*	*122*	*118*	*79*	*85*	*62*	*55*	*48*
85	Danvers, Mass	84	82	54	95	98	71	69	56	46	47	30	20	12
		80	*64*	*65*	*79*	*70*	*80*	*67*	*65*	*43*	*49*	*35*	*22*	*31*
86	Dedham, Mass	110	100	88	69	85	71	55	54	46	26	36	13	21
		103	*105*	*59*	*86*	*73*	*83*	*70*	*68*	*43*	*35*	*45*	*24*	*25*
87	Framingham, Mass	147	100	123	99	98	105	94	115	90	66	29	27	18
		138	*100*	*96*	*113*	*100*	*116*	*98*	*80*	*80*	*40*	*41*	*25*	*34*
88	Gardner, Mass	144	115	116	97	88	77	63	42	.....	45	36	32	22
		123	*114*	*95*	*83*	*94*	*80*	*78*	*50*	.....	*40*	*36*	*38*	*31*
89	Marlboro, Mass	151	153	146	133	154	132	113	49	56	46	27	20	12
		112	*138*	*150*	*136*	*115*	*131*	*115*	*59*	*78*	*54*	*37*	*34*	*29*
90	Melrose, Mass	147	159	153	147	138	174	148	108	111	65	80	42	42
		156	*145*	*136*	*176*	*159*	*147*	*157*	*133*	*104*	*87*	*70*	*79*	*49*
91	Medford, Mass	261	192	202	195	215	216	162	158	138	104	53	40	31
		247	*194*	*192*	*194*	*234*	*206*	*166*	*165*	*140*	*111*	*47*	*50*	*41*

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TABLE 2.—*Grade populations of certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Elementary school grades.									High school years.			
		1	2	3	4	5	6	7	8	9	1	2	3	4
92	Milford, Mass	197	142	130	101	91	82	59	53	39	51	20	11	5
		180	*159*	*96*	*117*	*82*	*81*	*66*	*68*	*35*	*29*	*31*	*11*	*22*
93	Montague, Mass	83	66	53	74	61	71	52	36	.....	32	23	12	11
		75	*59*	*57*	*48*	*55*	*57*	*51*	*32*	.....	*26*	*22*	*11*	*21*
94	Natick, Mass	80	88	80	85	99	94	68	65	58	43	35	16	15
		85	*101*	*79*	*80*	*93*	*89*	*82*	*62*	*68*	*47*	*43*	*25*	*24*
95	Newburyport, Mass	93	90	79	80	93	81	85	78	64	91	46	40	21
		104	*87*	*93*	*73*	*94*	*72*	*75*	*79*	*62*	*60*	*50*	*39*	*36*
96	North Attleboro, Mass	126	84	94	69	61	58	39	41	40	11	10	15	6
		106	*65*	*74*	*64*	*67*	*59*	*51*	*34*	*40*	*26*	*32*	*12*	*16*
97	Norwood, Mass	113	90	77	69	85	86	55	63	45	41	18	4	7
		94	*103*	*81*	*85*	*81*	*109*	*62*	*54*	*48*	*47*	*31*	*9*	*13*
98	Northbridge, Mass	84	120	101	88	75	85	57	54	.....	21	10	11	5
		69	*110*	*95*	*87*	*72*	*65*	*56*	*43*	.....	*39*	*17*	*13*	*6*
99	Peabody, Mass	164	103	90	112	104	107	102	84	65	43	27	19	22
		165	*90*	*94*	*102*	*112*	*99*	*84*	*58*	*60*	*37*	*27*	*19*	*20*
100	Revere, Mass	219	189	175	164	137	157	138	131	123	16	41	62	30
		181	*196*	*151*	*150*	*131*	*156*	*120*	*108*	*106*	*20*	*47*	*67*	*25*
101	Wakefield, Mass	138	89	103	120	121	103	107	77	65	55	50	41	23
		123	*115*	*97*	*99*	*114*	*89*	*116*	*72*	*62*	*73*	*37*	*44*	*44*
102	Westfield, Mass	124	121	117	109	126	86	100	34	.....	56	42	28	13
		145	*91*	*133*	*113*	*100*	*94*	*103*	*41*	.....	*75*	*70*	*41*	*32*
103	West Springfield, Mass	150	103	113	107	90	88	61	44	32	21	23	20	16
		146	*85*	*93*	*82*	*94*	*85*	*82*	*51*	*44*	*36*	*25*	*24*	*17*
104	Weymouth, Mass	154	93	106	138	117	151	98	79	73	43	59	20	10
		119	*70*	*112*	*140*	*98*	*208*	*78*	*74*	*57*	*42*	*52*	*33*	*23*
105	Winchester (town), Mass	103	143	69	100	88	82	79	56	40	31	32	26	10
		96	*101*	*102*	*81*	*83*	*82*	*72*	*62*	*39*	*44*	*32*	*31*	*19*
106	Winthrop, Mass	114	91	100	80	97	96	64	57	64	43	31	11	8
		96	*87*	*82*	*83*	*85*	*57*	*90*	*57*	*73*	*44*	*31*	*16*	*16*
107	Woburn, Mass	185	167	162	179	202	176	152	169	61	82	45	26	13
		193	*169*	*140*	*157*	*175*	*144*	*76*	*71*	*59*	*78*	*51*	*31*	*22*
108	Ann Arbor, Mich	180	98	124	100	112	87	101	75	.....	97	59	52	107
		186	*67*	*83*	*114*	*84*	*105*	*88*	*98*	.....	*105*	*77*	*59*	*49*
109	Cadillac, Mich	133	120	93	108	70	81	81	56	.....	37	19	31	10
		121	*100*	*90*	*77*	*83*	*102*	*65*	*84*	.....	*51*	*40*	*31*	*10*
110	Cheboygan, Mich	143	79	77	60	63	46	32	24	.....	23	10	9	1
		118	*67*	*65*	*62*	*50*	*57*	*40*	*36*	.....	*35*	*22*	*13*	*11*
111	Escanaba, Mich	173	116	100	111	120	100	105	81	.....	73	56	21	22
		168	*116*	*110*	*92*	*107*	*89*	*111*	*76*	.....	*88*	*63*	*41*	*29*

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112	Hancock, Mich.	176	112	48	57	57	43	50	22	.....	22	26	16	14
		166	*101*	*46*	*36*	*29*	*38*	*43*	*32*	.....	*8*	*33*	*12*	*11*
113	Holland, Mich.	114	98	86	97	97	81	76	47	.....	28	12	8	6
		98	*96*	*122*	*107*	*90*	*76*	*85*	*61*	.....	*49*	*16*	*14*	*9*
114	Iron Mountain, Mich.	109	148	120	151	135	103	103	58	.....	48	32	15	8
		116	*123*	*125*	*134*	*108*	*116*	*90*	*65*	.....	*51*	*21*	*19*	*10*
115	Ironwood, Mich.	149	162	139	114	112	87	53	74	.....	44	32	15	15
		173	*130*	*127*	*116*	*119*	*79*	*55*	*56*	.....	*51*	*33*	*13*	*11*
116	Ishpeming, Mich.	169	121	85	134	135	132	83	115	.....	76	45	23	25
		148	*123*	*122*	*115*	*122*	*111*	*100*	*104*	.....	*74*	*66*	*32*	*51*
117	Lansing, Mich.	273	234	184	224	174	153	131	78	.....	102	42	29	26
		284	*184*	*199*	*197*	*174*	*148*	*133*	*107*	.....	*117*	*55*	*45*	*27*
118	Marquette, Mich.	177	116	121	103	100	79	69	71	.....	41	24	13	14
		163	*104*	*108*	*87*	*73*	*79*	*73*	*73*	.....	*53*	*31*	*28*	*11*
119	Menominee, Mich.	163	150	119	128	89	85	89	58	.....	56	27	4	4
		130	*102*	*115*	*101*	*73*	*87*	*103*	*67*	.....	*63*	*46*	*16*	*14*
120	Muskegon, Mich.	231	192	199	194	203	174	170	34	.....	71	54	39	47
		244	*200*	*164*	*204*	*194*	*174*	*157*	*32*	.....	*90*	*83*	*38*	*47*
121	Saulte Ste. Marie, Mich.	218	104	100	122	97	87	75	46	.....	59	24	16	10
		204	*112*	*110*	*106*	*110*	*59*	*69*	*45*	.....	*40*	*37*	*21*	*13*
122	Meridian, Miss.	332	207	163	122	119	91	73	46	.....	52	35	15	2
		304	*171*	*162*	*119*	*128*	*90*	*97*	*90*	.....	*44*	*57*	*22*	*13*
123	Carthage, Mo.	145	108	106	116	71	85	79	37	.....	50	21	21	13
		120	*103*	*83*	*92*	*96*	*92*	*79*	*75*	.....	*80*	*58*	*24*	*19*
124	Great Falls, Mont.	200	128	163	137	130	106	90	67	.....	35	46	23	16
		147	*154*	*147*	*126*	*121*	*104*	*90*	*89*	.....	*77*	*41*	*31*	*33*
125	Concord (Union School District), N.H.	193	123	134	131	137	72	105	96	.....	88	62	29	13
		159	*142*	*140*	*141*	*130*	*87*	*126*	*106*	.....	*76*	*54*	*56*	*43*
126	Portsmouth, N. H.	116	95	67	66	78	63	63	55	.....	63	34	24	11
		106	*107*	*87*	*66*	*85*	*65*	*58*	*63*	.....	*70*	*40*	*17*	*22*
127	Bloomfield, N. J.	152	117	128	112	138	95	62	52	.....	40	34	7	7
		113	*113*	*104*	*112*	*106*	*107*	*89*	*63*	.....	*43*	*31*	*15*	*22*
128	Bridgeton, N. J.	167	163	114	127	95	70	72	48	.....	36	25	22	12
		156	*116*	*121*	*107*	*101*	*97*	*73*	*67*	.....	*39*	*34*	*35*	*22*
129	Garfield, N. J.	188	108	92	72	53	46	15	22	.....	.....	.....	.....	.....
		185	*103*	*94*	*48*	*68*	*49*	*12*	*10*	.....	.....	.....	.....	.....
130	Kearny, N. J.	300	165	169	167	152	121	104	66	.....	34	23	11	10
		297	*157*	*166*	*160*	*137*	*128*	*116*	*44*	.....	*47*	*31*	*19*	*15*
131	Long Branch, N. J.	126	136	137	143	161	80	79	42	.....	73	34	25	16
		155	*133*	*139*	*126*	*145*	*112*	*91*	*60*	.....	*56*	*35*	*18*	*21*
132	Irvington, N. J.	141	125	123	117	99	70	50	50	.....	27	7	3	2
		118	*137*	*110*	*96*	*76*	*85*	*63*	*31*	.....	*42*	*7*	*4*	*2*
133	Montclair, N. J.	221	171	189	167	176	103	102	97	.....	114	61	49	36
		195	*169*	*144*	*140*	*149*	*139*	*164*	*98*	.....	*95*	*2*	*64*	*42*
134	Morristown, N. J.	118	81	78	88	87	62	60	39	.....	25	17	11	10
		94	*71*	*83*	*71*	*77*	*63*	*46*	*42*	.....	*34*	*21*	*21*	*16*
135	Plainfield, N. J.	180	150	191	132	151	154	87	57	.....	68	35	29	24
		176	*160*	*169*	*149*	*132*	*134*	*100*	*69*	.....	*72*	*59*	*32*	*15*
136	Town of Union, N. J.	227	215	219	235	200	115	50	41	.....	68	59	40	19
		211	*206*	*232*	*209*	*192*	*109*	*65*	*59*	.....	*59*	*45*	*22*	*19*
137	Vineland, N. J.	155	127	118	96	111	58	40	35	.....	30	15	8	10
		133	*102*	*106*	*80*	*83*	*58*	*56*	*44*	.....	*44*	*20*	*20*	*9*

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TABLE 2.—*Grade populations of certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Elementary school grades.									High school years.			
		1	2	3	4	5	6	7	8	9	1	2	3	4
138	West New York, N. J.	223	176	150	162	121	85	49	29	.....	.....	.....	.....	.....
		211	*148*	*164*	*186*	*128*	*102*	*39*	*48*	.....	.....	.....	.....	.....
139	West Orange, N. J.	169	106	120	113	74	44	32	17	.....	15	19	6	5
		150	*102*	*86*	*86*	*66*	*62*	*42*	*26*	.....	*21*	*9*	*11*	*6*
140	Albuquerque, N. Mex.	186	91	94	88	77	80	36	34	.....	22	12	11	3
		137	*99*	*82*	*91*	*88*	*63*	*46*	*32*	.....	*32*	*17*	*6*	*14*
141	Amsterdam, N. Y.	241	235	168	185	146	128	75	25	.....	.....	.....	.....	.....
		208	*246*	*184*	*158*	*167*	*153*	*105*	*39*	.....	.....	.....	.....	.....
142	Dunkirk, N. Y.	156	116	91	103	80	89	73	63	.....	45	38	7	10
		160	*113*	*93*	*96*	*86*	*68*	*72*	*70*	.....	*26*	*32*	*33*	*13*
143	Gloversville, N. Y.	173	180	199	174	149	146	121	48	.....	81	44	38	7
		154	*155*	*176*	*135*	*134*	*150*	*117*	*46*	.....	*111*	*46*	*43*	*13*
144	Johnstown, N. Y.	112	95	97	92	60	76	68	56	.....	46	19	9	1
		126	*76*	*83*	*76*	*78*	*57*	*57*	*54*	.....	*45*	*24*	*13*	*19*
145	New Rochelle, N. Y.	438	409	273	253	155	138	142	91	.....	75	36	31	13
		344	*341*	*261*	*225*	*144*	*125*	*136*	*95*	.....	*60*	*34*	*18*	*17*
146	Olean, N. Y.	120	114	142	117	151	98	88	90	.....	51	32	29	22
		131	*126*	*119*	*130*	*121*	*120*	*67*	*87*	.....	*69*	*45*	*34*	*27*
147	Port Chester, N. Y.	198	124	91	124	88	93	91	52	.....	34	24	12	9
		199	*119*	*90*	*109*	*97*	*94*	*97*	*35*	.....	*44*	*19*	*17*	*11*
148	White Plains, N. Y.	106	111	121	120	95	84	56	44	.....	46	28	21	11
		86	*110*	*117*	*122*	*102*	*94*	*102*	*58*	.....	*69*	*48*	*20*	*16*
149	Asheville, N. C.	460	251	190	126	129	81	66	.....	.....	.....	.....	.....	.....
		345	*263*	*207*	*147*	*138*	*91*	*106*	.....	.....	.....	.....	.....	.....
150	Newbern, N. C.	191	67	75	51	46	36	19	.....	.....	.....	.....	.....	.....
		226	*104*	*87*	*61*	*78*	*54*	*20*	.....	.....	.....	.....	.....	.....
151	Alliance, Ohio	206	133	136	137	117	125	107	86	.....	72	26	27	.....
		210	*148*	*138*	*123*	*109*	*124*	*101*	*96*	.....	*54*	*57*	*29*	.....
152	Newark, Ohio	255	226	232	202	212	136	145	105	.....	62	46	33	34
		185	*172*	*218*	*190*	*204*	*168*	*123*	*83*	.....	*95*	*70*	*50*	*47*
153	Norwood, Ohio	111	113	95	107	82	84	60	44	.....	42	12	14	6
		96	*93*	*110*	*95*	*71*	*93*	*87*	*57*	.....	*45*	*27*	*30*	*25*
154	Portsmouth, Ohio	279	230	264	223	200	143	126	76	.....	76	31	22	11
		264	*220*	*223*	*227*	*205*	*132*	*101*	*97*	.....	*55*	*28*	*27*	*19*
155	Sidney, Ohio	104	50	58	48	42	47	38	37	.....	39	31	30	18
		71	*58*	*68*	*62*	*70*	*47*	*46*	*31*	.....	*31*	*28*	*27*	*27*
156	Steubenville, Ohio	295	199	182	162	141	81	88	45	.....	58	15	8	18
		311	*169*	*193*	*145*	*118*	*126*	*98*	*55*	.....	*41*	*31*	*21*	*11*
157	Enid, Okla.	146	97	112	150	130	65	72	58	.....	49	12	15	3
		125	*72*	*126*	*118*	*132*	*97*	*82*	*87*	.....	*74*	*34*	*33*	*12*

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158	McAlester, Okla.	139	95	101	76	46	56	22	.....	.....	27	8	4	3
		125	*78*	*90*	*61*	*49*	*58*	*39*	.....	.....	*35*	*21*	*19*	*11*
159	Beaver Falls, Pa.	111	105	128	119	83	66	57	23	.....	23	14	7	10
		125	*93*	*111*	*80*	*86*	*66*	*63*	*39*	.....	*32*	*28*	*15*	*11*
160	Carbondale, Pa.	202	185	194	150	139	124	89	84	.....	53	32	22	7
		219	*170*	*175*	*155*	*148*	*96*	*100*	*102*	.....	*82*	*56*	*34*	*7*
161	Carlisle, Pa.	97	114	86	82	91	66	73	51	.....	47	23	18	11
		100	*99*	*92*	*96*	*98*	*80*	*66*	*45*	.....	*46*	*33*	*29*	*17*
162	Charleroi, Pa.	200	106	167	137	48	46	21	17	.....	16	3	7	.....
		187	*96*	*158*	*151*	*67*	*55*	*30*	*25*	.....	*17*	*10*	*5*	.....
163	Clearfield, Pa.	81	104	72	69	95	62	32	31	.....	29	18	9	4
		73	*88*	*61*	*66*	*102*	*52*	*33*	*32*	.....	*36*	*25*	*9*	*11*
164	Columbia, Pa.	133	97	103	121	103	60	65	44	39	24	15	7	10
		118	*101*	*116*	*115*	*116*	*74*	*64*	*51*	*35*	*21*	*27*	*16*	*12*
165	Donora, Pa.	139	80	69	83	56	47	16	9	.....	8	5	2	.....
		151	*75*	*70*	*33*	*58*	*32*	*28*	*11*	.....	*16*	*10*	*7*	.....
166	Franklin, Pa.	99	85	59	58	57	65	51	61	.....	36	22	14	16
		79	*80*	*87*	*65*	*54*	*63*	*66*	*59*	.....	*52*	*31*	*26*	*18*
167	Homestead, Pa.	161	161	133	105	93	92	54	38	.....	35	28	15	8
		211	*153*	*126*	*92*	*65*	*69*	*48*	*57*	.....	*59*	*21*	*14*	*21*
168	Lebanon, Pa.	226	190	158	173	142	135	104	79	67	34	26	25	18
		211	*169*	*160*	*157*	*140*	*121*	*101*	*90*	*65*	*57*	*47*	*28*	*25*
169	Mahanoy City, Pa.	230	217	200	180	107	39	46	38	.....	18	14	12	10
		202	*254*	*187*	*198*	*107*	*57*	*48*	*65*	.....	*29*	*30*	*16*	*9*
170	North Braddock, Pa.	208	242	187	130	82	60	48	11	.....	.....	.....	.....	.....
		215	*220*	*182*	*115*	*86*	*90*	*50*	*15*	.....	.....	.....	.....	.....
171	Plymouth, Pa.	255	221	102	189	111	39	91	24	.....	22	9	12	.....
		232	*241*	*106*	*157*	*70*	*76*	*62*	*39*	.....	*16*	*14*	*8*	.....
172	Pottstown, Pa.	154	141	151	135	170	119	93	77	.....	66	52	33	17
		151	*153*	*154*	*156*	*135*	*119*	*91*	*88*	.....	*51*	*48*	*31*	*31*
173	Sharon, Pa.	145	138	134	133	111	100	73	77	.....	56	28	28	16
		169	*137*	*114*	*114*	*117*	*100*	*90*	*69*	.....	*57*	*42*	*43*	*13*
174	Sunbury, Pa.	181	158	125	116	107	105	70	58	57	50	31	17	12
		149	*144*	*133*	*125*	*105*	*77*	*101*	*66*	*43*	*50*	*29*	*27*	*15*
175	Warren, Pa.	198	91	112	112	84	87	82	70	26	52	26	17	10
		157	*98*	*114*	*98*	*101*	*97*	*90*	*57*	*28*	*51*	*22*	*16*	*20*
176	Central Falls, R. I.	138	103	103	92	94	65	48	25	31	33	18	12	3
		148	*93*	*70*	*75*	*80*	*77*	*54*	*43*	*40*	*31*	*8*	*12*	9
177	Spartanburg, S. C.	349	158	133	121	97	87	58	.....	.....	.....	.....	.....	.....
		347	*232*	*264*	*129*	*98*	*78*	*83*	.....	.....	.....	.....	.....	.....
178	Beaumont, Tex.	374	239	164	128	102	70	47	.....	.....	52	18	15	9
		379	*190*	*204*	*169*	*110*	*106*	*104*	.....	.....	*78*	*38*	*29*	*24*
179	Ogden, Utah	391	353	304	257	241	201	177	122	.....	54	48	46	33
		345	*295*	*272*	*247*	*220*	*213*	*217*	*174*	.....	*72*	*72*	*52*	*37*
180	Everett, Wash.	235	204	130	190	213	131	168	154	.....	70	43	21	19
		261	*180*	*120*	*183*	*228*	*150*	*185*	*172*	.....	*96*	*57*	*33*	*27*
181	Clarksburg, W. Va.	196	126	112	125	113	65	56	40	.....	34	24	13	9
		172	*116*	*118*	*89*	*85*	*64*	*68*	*40*	.....	*40*	*31*	*17*	*16*
182	Appleton, Wis.	139	119	123	101	100	89	67	50	.....	58	37	25	15
		146	*113*	*151*	*109*	*87*	*79*	*60*	*61*	.....	*64*	*45*	*29*	*23*
183	Beloit, Wis.	188	132	146	145	138	140	102	84	.....	64	22	29	17
		184	*139*	*162*	*128*	*130*	*120*	*99*	*75*	.....	*105*	*42*	*50*	*40*

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TABLE 2.—*Grade populations of certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are in italics.]

	Cities.	Elementary school grades.									High school years.			
		1	2	3	4	5	6	7	8	9	1	2	3	4
184	Fond du Lac, Wis.	172	147	141	138	109	106	72	89	.....	70	45	43	25
		193	*142*	*149*	*136*	*152*	*120*	*98*	*97*	.....	*79*	*53*	*47*	*29*
185	Marinette, Wis.	180	165	119	125	142	132	90	84	.....	74	44	42	16
		146	*183*	*155*	*144*	*163*	*117*	*112*	*111*	.....	*46*	*55*	*54*	*30*
186	Wausau, Wis.	325	151	142	127	105	128	96	74	.....	80	45	30	12
		296	*154*	*115*	*146*	*108*	*124*	*100*	*79*	.....	*83*	*55*	*32*	*17*

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TABLE 3.—*Distribution, by age, of pupils in the public schools (elementary and secondary) in certain cities of 25,000 population and over.*

[Throughout this table, the figures that represent girls are printed in italics.]

	Cities.	Age.															
		5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
1	Birmingham, Ala.	0	50	355	380	407	363	384	354	329	243	207	119	76	30	13	9
		0	*47*	*350*	*406*	*364*	*444*	*369*	*422*	*399*	*288*	*217*	*179*	*102*	*88*	*34*	*10*
2	Mobile, Ala.	5	114	141	189	177	212	198	175	194	113	88	44	26	10	3	0
		19	*132*	*173*	*155*	*162*	*181*	*177*	*202*	*218*	*177*	*123*	*123*	*77*	*31*	*4*	*4*
3	Montgomery, Ala.	0	73	182	231	189	198	198	207	182	101	54	29	5	1	0	0
		0	*72*	*204*	*205*	*215*	*228*	*243*	*222*	*215*	*172*	*145*	*92*	*49*	*19*	*4*	.....
4	Little Rock, Ark.	30	194	259	291	254	286	262	220	258	296	211	177	95	35	5	3
		35	*165*	*270*	*301*	*312*	*280*	*285*	*292*	*296*	*309*	*288*	*268*	*125*	*29*	*3*	*2*
5	Los Angeles, Cal.	2	1,261	1,407	1,518	1,441	1,501	1,580	1,682	1,493	1,516	956	629	424	245	115	69
		1	*1,192*	*1,384*	*1,461*	*1,379*	*1,533*	*1,469*	*1,530*	*1,465*	*1,435*	*989*	*646*	*431*	*196*	*70*	*31*
6	Pueblo (Dist. No. 20), Colo.	0	152	129	162	156	136	143	140	123	123	96	52	34	23	5	0
		0	*136*	*139*	*168*	*128*	*135*	*141*	*147*	*136*	*114*	*106*	*66*	*68*	*29*	*9*	*5*
7	Pueblo, Colo.	7	77	126	118	123	95	118	108	98	74	55	59	30	8	4	4
		2	*64*	*113*	*114*	*117*	*106*	*101*	*128*	*106*	*96*	*94*	*56*	*47*	*39*	*10*	*5*
8	Bridgeport, Conn.	331	577	589	611	593	644	626	609	582	369	183	117	62	51	13	10
		337	*540*	*590*	*616*	*592*	*643*	*622*	*621*	*579*	*372*	*190*	*127*	*85*	*77*	*24*	*20*
9	New Haven, Conn.	492	845	869	1,025	967	955	942	994	1,031	726	416	256	113	67	16	5
		470	*823*	*875*	*981*	*932*	*990*	*981*	*1,010*	*903*	*627*	*436*	*288*	*159*	*56*	*8*	*2*
10	Meriden, Conn.	40	155	208	196	200	179	169	163	173	170	85	50	24	14	5	2
		42	*150*	*163*	*177*	*163*	*171*	*169*	*182*	*187*	*179*	*97*	*71*	*31*	*27*	*7*	*0*
11	Waterbury, Conn.	227	393	454	465	445	439	430	484	431	342	225	156	42	34	9	1
		238	*386*	*435*	*458*	*423*	*454*	*555*	*406*	*448*	*365*	*213*	*135*	*68*	*43*	*3*	*2*
12	(a) Savannah, Ga.	.....	117	253	269	256	252	257	222	198	168	105	70	28	6	0	0
		.....	*100*	*239*	*232*	*228*	*275*	*279*	*256*	*232*	*227*	*165*	*114*	*47*	*8*	*1*	*0*
	(b) Savannah, Ga. (colored)[1]	.....	27	58	71	127	116	113	118	102	79	47	26	7	2	0	0
		.....	*42*	*71*	*123*	*163*	*149*	*169*	*160*	*158*	*129*	*98*	*37*	*18*	*3*	*1*	*0*
13	Aurora, Ill.	.....	136	114	128	96	93	108	115	122	123	62	48	30	14	1	.....
		.....	*132*	*106*	*113*	*105*	*101*	*99*	*95*	*106*	*90*	*73*	*53*	*24*	*7*	*2*	*0*
14	Aurora (West Side), Ill.	.....	53	47	51	49	51	50	62	70	39	44	31	16	10	4	5
		.....	*74*	*79*	*65*	*66*	*58*	*61*	*53*	*53*	*51*	*51*	*33*	*19*	*5*	*5*	*0*
15	Chicago, Ill.	393	10,931	12,028	12,593	12,143	12,180	11,576	12,276	12,652	9,281	4,864	2,068	979	414	150	59
		377	*10,090*	*11,412*	*12,246*	*11,731*	*11,787*	*11,255*	*12,048*	*11,858*	*8,408*	*4,735*	*2,365*	*1,240*	*543*	*161*	*62*
16	Danville, Ill.	.....	174	197	212	229	212	194	208	195	166	188	50	30	22	10	0
		1	*201*	*207*	*226*	*198*	*229*	*197*	*182*	*184*	*152*	*116*	*89*	*46*	*16*	*8*	*3*
17	Decatur, Ill.	.....	164	209	223	233	193	197	241	178	181	101	74	43	17	1	2
		.....	*148*	*229*	*238*	*202*	*206*	*238*	*233*	*254*	*176*	*154*	*78*	*40*	*22*	*5*	*1*

[1] Elementary schools only reported.

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TABLE 3.—*Distribution, by age, of pupils in the public schools (elementary and secondary) in certain cities of 25,000 population and over*—Continued.

[Throughout this table, the figures that represent girls are printed in italics.]

	Cities.	Age.															
		5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
18	Joliet, Ill.[1]	.....	244	269	284	260	256	230	251	258	163	94	8	4	.....	.....	.....
		.....	*272*	*266*	*258*	*240*	*217*	*232*	*257*	*268*	*154*	*54*	*9*	*0*	.....	.....	.....
19	Quincy, Ill	46	177	172	182	175	207	167	178	175	162	99	69	32	24	10	21
		44	*152*	*176*	*179*	*154*	*166*	*171*	*185*	*150*	*125*	*69*	*62*	*31*	*4*	*2*	*0*
20	Rockford, Ill	13	238	322	321	310	346	307	329	298	221	151	120	93	37	13	4
		7	*250*	*284*	*304*	*292*	*317*	*337*	*337*	*297*	*263*	*186*	*124*	*101*	*38*	*9*	*4*
21	Springfield, Ill	.....	267	349	350	306	297	312	305	286	288	130	76	56	28	10	2
		.....	*252*	*321*	*335*	*318*	*303*	*282*	*273*	*350*	*220*	*168*	*115*	*78*	*23*	*7*	*0*
22	Anderson, Ind	3	121	172	196	167	156	176	157	163	122	89	54	67	32	16	4
		5	*97*	*173*	*188*	*170*	*158*	*165*	*152*	*142*	*139*	*98*	*75*	*46*	*97*	*7*	*2*
23	Fort Wayne, Ind	17	289	229	269	245	267	294	264	250	170	121	79	52	20	7	3
		18	*316*	*262*	*284*	*266*	*285*	*256*	*267*	*280*	*174*	*130*	*95*	*63*	*37*	*13*	*2*
24	Indianapolis, Ind	37	1,169	1,257	1,458	1,341	1,287	1,265	1,270	1,308	1,010	619	380	234	113	36	10
		40	*1,159*	*1,221*	*1,276*	*1,238*	*1,294*	*1,325*	*1,302*	*1,216*	*1,014*	*632*	*430*	*306*	*152*	*35*	*14*
25	Marion, Ind	.....	144	176	149	148	170	176	156	170	115	83	50	27	12	8	3
		.....	*135*	*156*	*156*	*143*	*173*	*165*	*175*	*163*	*135*	*95*	*60*	*44*	*20*	*3*	*1*
26	Muncie, Ind	.....	151	189	174	142	159	164	173	163	120	73	58	39	15	14	1
		.....	*161*	*182*	*196*	*189*	*182*	*152*	*181*	*172*	*134*	*98*	*77*	*63*	*34*	*8*	*4*
27	Terre Haute, Ind	5	375	450	479	438	392	356	383	366	296	166	136	56	30	16	2
		10	*381*	*444*	*408*	*394*	*436*	*418*	*372*	*339*	*278*	*192*	*104*	*88*	*36*	*0*	*6*
28	Burlington, Iowa	53	121	146	168	163	182	162	164	160	132	88	55	17	8	0	0
		39	*111*	*180*	*175*	*195*	*203*	*164*	*172*	*174*	*158*	*106*	*64*	*29*	*22*	*4*	*0*
29	Council Bluffs, Iowa	9	173	247	276	239	239	232	207	232	171	136	84	47	19	14	5
		8	*187*	*218*	*234*	*231*	*234*	*262*	*237*	*237*	*187*	*162*	*81*	*61*	*34*	*15*	*3*
30	Des Moines, Iowa	25	405	543	614	574	591	555	582	538	433	333	230	190	101	40	9
		21	*401*	*548*	*603*	*554*	*540*	*590*	*584*	*515*	*458*	*362*	*279*	*209*	*106*	*28*	*4*
31	Dubuque, Iowa	3	50	146	145	165	111	155	147	153	144	116	54	29	17	12	1
		6	*55*	*120*	*165*	*137*	*133*	*157*	*144*	*174*	*138*	*96*	*62*	*52*	*17*	*7*	*2*
32	Kansas City Kans	10	354	457	454	419	478	413	459	424	430	294	153	83	50	24	10
		20	*371*	*455*	*430*	*469*	*463*	*457*	*441*	*467*	*465*	*329*	*243*	*157*	*94*	*41*	*11*
33	Topeka Kans	1	226	245	265	278	309	262	273	300	251	203	122	104	72	39	18
		0	*247*	*251*	*271*	*270*	*303*	*257*	*265*	*252*	*268*	*231*	*178*	*120*	*79*	*36*	*9*
34	Wichita, Kans	0	248	239	278	270	286	271	289	258	241	195	120	56	27	13	2
		0	*242*	*271*	*285*	*311*	*279*	*313*	*315*	*342*	*264*	*215*	*161*	*80*	*42*	*13*	*4*
35	Covington, Ky	4	128	187	213	167	163	174	213	183	137	69	37	20	11	4	1
		2	*143*	*161*	*192*	*170*	*198*	*178*	*197*	*182*	*148*	*71*	*54*	*22*	*17*	*5*	*3*
36	Louisville Ky	5	1,065	1,106	1,229	1,179	1,280	1,243	1,169	1,243	996	622	346	203	97	42	6
		7	*1,021*	*1,116*	*1,199*	*1,179*	*1,293*	*1,196*	*1,282*	*1,389*	*1,017*	*622*	*424*	*260*	*114*	*19*	*2*

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37	Lewiston, Me.	13	51	71	80	88	71	77	102	108	109	75	39	47	19	12	7
		15	*37*	*83*	*66*	*83*	*75*	*81*	*95*	*91*	*80*	*83*	*55*	*35*	*18*	*9*	*3*
38	Brockton, Mass.	223	364	370	391	413	404	411	389	416	341	220	132	84	52	16	6
		318	*525*	*566*	*598*	*577*	*408*	*394*	*405*	*400*	*313*	*237*	*140*	*113*	*58*	*15*	*1*
39	Everett, Mass.	186	257	258	294	292	276	248	282	305	214	145	65	45	24	8	0
		214	*271*	*280*	*287*	*308*	*325*	*303*	*302*	*297*	*235*	*185*	*95*	*62*	*25*	*9*	*0*
40	Fall River, Mass.	535	639	673	738	724	700	677	780	848	335	179	101	70	39	9	3
		474	*629*	*722*	*728*	*592*	*645*	*619*	*782*	*703*	*305*	*168*	*124*	*102*	*42*	*9*	*3*
41	Fitchburg, Mass.	77	147	190	200	191	194	146	185	198	152	111	67	55	22	7	5
		72	*150*	*206*	*205*	*181*	*176*	*173*	*195*	*215*	*125*	*121*	*76*	*53*	*29*	*5*	*1*
42	Haverhill, Mass.	183	242	240	262	243	205	237	278	231	224	143	92	53	32	14	17
		149	*205*	*241*	*253*	*215*	*252*	*233*	*229*	*227*	*238*	*144*	*92*	*55*	*43*	*17*	*3*
43	Holyoke, Mass.	164	269	246	214	287	262	266	240	324	219	152	87	41	22	6	3
		176	*219*	*185*	*235*	*307*	*257*	*271*	*261*	*295*	*222*	*117*	*101*	*72*	*42*	*9*	*1*
44	Lowell, Mass.	315	499	514	498	473	463	514	530	601	396	263	153	109	34	16	6
		339	*454*	*470*	*438*	*472*	*458*	*487*	*560*	*586*	*366*	*261*	*138*	*135*	*62*	*11*	*1*
45	Malden, Mass.	179	263	292	300	304	298	326	319	348	290	203	127	74	35	13	1
		187	*285*	*304*	*264*	*284*	*342*	*315*	*386*	*358*	*276*	*193*	*159*	*112*	*51*	*12*	*5*
46	New Bedford, Mass.	1	435	713	659	577	563	458	506	543	255	114	90	61	16	8	2
		326	*471*	*554*	*614*	*487*	*568*	*528*	*488*	*506*	*205*	*118*	*89*	*64*	*37*	*13*	*2*
47	Newton, Mass.	123	224	272	230	267	245	240	257	274	223	195	133	76	59	16	2
		101	*213*	*275*	*252*	*237*	*259*	*253*	*258*	*253*	*230*	*195*	*130*	*101*	*61*	*18*	*5*
48	Pittsfield, Mass.	141	187	205	181	191	241	191	200	221	134	104	72	47	37	13	4
		145	*198*	*214*	*198*	*185*	*181*	*193*	*206*	*196*	*135*	*99*	*81*	*68*	*39*	*7*	*4*
49	Quincy, Mass.	216	365	353	212	266	259	342	302	313	246	157	85	55	13	3	0
		251	*345*	*334*	*187*	*239*	*245*	*347*	*285*	*293*	*238*	*140*	*95*	*44*	*10*	*2*	*0*
50	Somerville, Mass.	412	534	523	574	517	541	544	550	490	430	336	196	142	78	17	10
		402	*500*	*518*	*505*	*509*	*549*	*513*	*530*	*460*	*460*	*349*	*279*	*173*	*114*	*36*	*5*
51	Taunton, Mass.	134	186	188	210	190	226	189	219	206	163	114	55	33	7	4	1
		136	*172*	*193*	*198*	*210*	*210*	*188*	*220*	*216*	*148*	*147*	*82*	*43*	*14*	*2*	*0*
52	Waltham, Mass.	40	116	141	128	89	121	129	138	128	104	81	64	38	19	8	1
		47	*137*	*118*	*132*	*102*	*157*	*126*	*127*	*112*	*117*	*98*	*78*	*54*	*28*	*5*	*0*
53	Worcester, Mass.	179	887	905	919	854	834	838	986	884	695	390	244	174	82	35	14
		172	*760*	*839*	*912*	*845*	*827*	*852*	*865*	*800*	*625*	*419*	*279*	*193*	*92*	*13*	*2*
54	Battle Creek, Mich.	.....	38	90	128	136	165	165	154	157	145	120	106	41	38	11	6
		.....	*31*	*112*	*154*	*140*	*156*	*145*	*142*	*187*	*176*	*133*	*104*	*78*	*42*	*30*	*5*
55	Bay City, Mich.	88	279	326	230	195	224	232	247	269	283	144	115	53	39	11	2
		72	*167*	*264*	*277*	*215*	*240*	*224*	*215*	*247*	*236*	*252*	*111*	*65*	*32*	*10*	*2*
56	Calumet, Mich.	35	182	281	310	245	240	205	213	225	200	174	82	31	29	9	7
		28	*194*	*292*	*280*	*252*	*219*	*217*	*211*	*187*	*184*	*157*	*90*	*58*	*31*	*17*	*5*
57	Detroit, Mich.	43	1,626	2,143	2,267	2,092	2,090	2,069	2,020	1,983	1,584	1,019	528	328	183	79	25
		38	*1,524*	*2,054*	*2,110*	*2,013*	*2,058*	*1,976*	*2,012*	*1,836*	*1,410*	*963*	*582*	*380*	*221*	*82*	*25*
58	Grand Rapids, Mich.	10	213	496	592	572	518	573	598	580	534	512	385	146	105	40	14
		5	*228*	*515*	*611*	*536*	*509*	*547*	*575*	*612*	*544*	*563*	*323*	*216*	*93*	*32*	*6*
59	Kalamazoo, Mich.	1	174	185	237	223	227	190	220	234	208	161	86	39	31	12	3
		2	*183*	*205*	*228*	*218*	*218*	*207*	*240*	*218*	*211*	*153*	*84*	*72*	*53*	*8*	*1*
60	Saginaw, Mich.	6	191	185	175	154	159	160	167	170	192	181	94	90	27	15	3
		11	*199*	*180*	*179*	*187*	*163*	*154*	*159*	*192*	*191*	*163*	*91*	*70*	*28*	*2*	*3*
61	Saginaw (West Side), Mich.	20	107	138	134	144	126	87	132	120	144	83	36	18	7	3	0
		25	*123*	*135*	*103*	*116*	*129*	*107*	*139*	*127*	*110*	*65*	*41*	*22*	*18*	*7*	*2*

[1] Elementary schools only reported.

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TABLE 3.—*Distribution, by age, of pupils in the public schools (elementary and secondary) in certain cities of 25,000 population and over*—Continued.

[Throughout this table, the figures that represent girls are printed in italics.]

	Cities.	Age.															
		5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
62	Duluth, Minn.	54	462	496	570	514	538	549	523	500	434	299	116	84	48	19	10
		47	*382*	*482*	*578*	*539*	*522*	*491*	*531*	*488*	*443*	*298*	*179*	*117*	*51*	*9*	*2*
63	Minneapolis, Minn.	12	1,353	1,689	1,843	1,794	1,799	1,793	1,852	1,784	1,782	1,429	820	452	321	150	64
		13	*1,430*	*1,658*	*1,761*	*1,724*	*1,790*	*1,837*	*1,900*	*1,839*	*1,807*	*1,519*	*964*	*653*	*391*	*124*	*58*
64	St. Joseph, Mo.	0	450	467	519	479	444	469	473	424	361	237	139	63	38	22	9
		0	*460*	*446*	*463*	*439*	*489*	*507*	*501*	*443*	*378*	*273*	*141*	*100*	*50*	*23*	*9*
65	St. Louis Mo.	6	83	3,107	3,753	3,707	3,771	3,739	3,893	3,850	2,547	1,346	627	361	193	82	19
		3	*63*	*3,250*	*3,914*	*3,591*	*3,671*	*3,826*	*3,775*	*3,728*	*2,552*	*1,575*	*951*	*583*	*340*	*139*	*73*
66	Butte, Mont.	0	287	258	303	264	282	253	261	259	263	181	99	49	30	15	2
		0	*315*	*298*	*296*	*277*	*251*	*305*	*281*	*251*	*214*	*152*	*105*	*88*	*46*	*14*	*3*
67	East Orange, N. J.	35	159	205	222	188	216	209	212	215	185	128	90	50	27	8	2
		21	*155*	*171*	*213*	*212*	*187*	*219*	*217*	*187*	*201*	*147*	*106*	*63*	*33*	*8*	*4*
68	Hoboken, N. J.	48	304	414	449	423	498	461	445	399	241	98	38	24	12	2	1
		42	*271*	*416*	*483*	*446*	*435*	*435*	*431*	*328*	*201*	*117*	*43*	*22*	*10*	*2*	*0*
69	New Brunswick, N. J.	23	83	99	105	98	150	109	136	108	93	62	33	24	5	0	0
		36	*69*	*114*	*113*	*130*	*124*	*113*	*107*	*95*	*79*	*73*	*41*	*23*	*8*	*1*	*0*
70	Orange, N. J.	12	235	170	160	142	164	163	175	144	111	65	37	12	11	3	0
		16	*117*	*175*	*200*	*144*	*156*	*155*	*161*	*133*	*96*	*58*	*38*	*29*	*12*	*6*	*2*
71	Paterson, N. J.	194	619	747	871	840	878	856	867	755	476	230	117	64	38	12	2
		95	*538*	*759*	*874*	*815*	*904*	*838*	*860*	*681*	*409*	*219*	*153*	*107*	*76*	*55*	*31*
72	Passaic, N. J.	11	202	283	332	303	330	268	295	266	167	76	51	20	9	2	1
		10	*192*	*307*	*301*	*306*	*291*	*282*	*287*	*238*	*110*	*59*	*55*	*26*	*14*	*1*	*0*
73	Perth Amboy, N. J.	118	189	231	241	237	210	213	214	190	132	83	36	24	8	1	1
		125	*220*	*241*	*255*	*229*	*227*	*184*	*167*	*159*	*108*	*74*	*39*	*32*	*11*	*1*	*0*
74	Trenton, N. J.	151	447	496	528	516	541	466	489	474	301	167	73	45	20	9	2
		174	*463*	*585*	*577*	*496*	*486*	*505*	*524*	*429*	*285*	*231*	*151*	*62*	*33*	*9*	*4*
75	Albany, N. Y.	144	398	449	496	468	441	479	490	498	424	260	119	74	26	13	10
		125	*400*	*444*	*350*	*439*	*485*	*444*	*514*	*450*	*351*	*284*	*169*	*108*	*43*	*6*	*2*
76	Auburn, N. Y.	37	136	182	176	151	169	167	163	153	138	101	75	50	20	7	5
		39	*158*	*160*	*139*	*149*	*164*	*170*	*150*	*143*	*148*	*120*	*57*	*34*	*24*	*10*	*1*
77	Elmira, N. Y.	67	145	179	203	184	203	196	204	171	192	155	107	64	33	16	4
		65	*149*	*169*	*144*	*159*	*194*	*178*	*222*	*202*	*172*	*182*	*127*	*83*	*43*	*13*	*4*
78	Jamestown, N. Y.	20	169	186	194	197	217	235	214	223	175	92	70	35	27	7	7
		12	*186*	*187*	*204*	*185*	*211*	*210*	*217*	*207*	*177*	*123*	*73*	*57*	*27*	*17*	*10*
79	Kingston, N. Y.	57	133	159	151	146	202	162	188	175	200	95	73	40	25	8	1
		69	*125*	*146*	*160*	*160*	*166*	*162*	*194*	*182*	*150*	*118*	*84*	*49*	*25*	*10*	*8*
80	Newburgh, N. Y.	67	132	133	136	148	165	173	158	188	130	80	47	34	20	6	1
		56	*121*	*139*	*135*	*147*	*202*	*175*	*176*	*166*	*131*	*103*	*47*	*33*	*13*	*8*	*4*

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81	Niagara Falls, N. Y.	21	140	156	172	179	168	186	158	189	159	94	75	42	31	6	1
		27	*155*	*162*	*165*	*141*	*144*	*162*	*159*	*178*	*130*	*123*	*70*	*52*	*34*	*8*	*2*
82	Poughkeepsie, N. Y.	39	87	104	129	126	137	134	166	155	138	90	55	26	13	0	2
		27	*91*	*122*	*123*	*129*	*146*	*126*	*171*	*145*	*138*	*102*	*57*	*35*	*16*	*12*	*5*
83	Rochester, N. Y.[1]	774	504	635	889	907	870	933	1,021	938	626	177	32	0	0	0	0
		52	*755*	*906*	*925*	*879*	*999*	*1,024*	*1,006*	*843*	*521*	*154*	*28*	*0*	*0*	*0*	*0*
84	Schenectady, N. Y.	21	437	546	485	453	449	444	468	428	389	261	131	87	43	23	15
		32	*407*	*488*	*443*	*449*	*446*	*407*	*449*	*416*	*337*	*251*	*154*	*80*	*54*	*28*	*9*
85	Syracuse, N. Y.	206	595	707	754	705	748	756	825	813	611	413	231	144	69	33	21
		170	*612*	*664*	*694*	*754*	*805*	*766*	*792*	*758*	*623*	*417*	*311*	*165*	*118*	*42*	*16*
86	Troy, N. Y.	104	188	222	267	246	263	263	299	278	256	147	66	55	18	7	5
		89	*188*	*235*	*240*	*233*	*263*	*251*	*251*	*243*	*215*	*145*	*76*	*48*	*26*	*1*	*1*
87	Utica, N. Y.	10	265	386	402	418	414	399	460	446	324	194	124	50	32	10	11
		11	*258*	*321*	*407*	*388*	*392*	*388*	*402*	*405*	*293*	*155*	*115*	*62*	*58*	*20*	*5*
88	Watertown, N. Y.	21	140	191	202	192	223	216	215	210	185	127	78	69	38	12	4
		34	*144*	*162*	*177*	*195*	*185*	*211*	*224*	*209*	*169*	*160*	*106*	*57*	*41*	*13*	*7*
89	Yonkers, N. Y.	260	370	570	616	624	512	576	516	494	425	278	116	62	35	4	5
		232	*506*	*574*	*551*	*515*	*545*	*565*	*520*	*451*	*389*	*251*	*155*	*72*	*41*	*22*	*8*
90	Akron, Ohio	143	409	424	415	399	372	396	391	429	350	251	139	66	22	3	0
		124	*409*	*446*	*428*	*415*	*366*	*390*	*418*	*402*	*312*	*204*	*143*	*57*	*24*	*9*	*1*
91	Canton, Ohio	5	235	313	303	295	254	307	309	299	290	199	117	61	25	13	2
		8	*225*	*324*	*289*	*335*	*301*	*302*	*307*	*274*	*276*	*193*	*95*	*51*	*40*	*20*	*2*
92	Columbus, Ohio	0	1,073	995	985	1,084	1,044	1,030	1,049	1,051	911	671	413	215	154	61	17
		0	*1,035*	*1,051*	*1,041*	*1,029*	*1,118*	*1,055*	*1,087*	*1,054*	*943*	*749*	*465*	*231*	*126*	*39*	*13*
93	Dayton, Ohio	17	467	520	625	568	558	545	592	536	528	333	227	109	58	7	1
		4	*483*	*499*	*568*	*630*	*586*	*539*	*571*	*556*	*457*	*342*	*230*	*178*	*54*	*6*	*0*
94	Hamilton, Ohio	0	176	212	264	193	236	210	226	196	163	111	81	43	42	10	6
		0	*161*	*202*	*203*	*209*	*211*	*237*	*200*	*199*	*129*	*90*	*47*	*45*	*34*	*18*	*3*
95	Springfield, Ohio	19	241	302	309	274	309	291	296	306	265	188	93	45	13	1	0
		13	*218*	*285*	*282*	*274*	*266*	*276*	*271*	*275*	*267*	*180*	*112*	*75*	*21*	*4*	*1*
96	Toledo, Ohio	35	903	907	979	889	1,001	938	167	1,010	807	556	254	167	85	24	14
		35	*881*	*929*	1,002	*883*	*858*	*886*	*849*	*866*	*758*	*417*	*312*	*187*	*94*	*22*	*7*
97	Youngstown, Ohio[1]	0	397	403	370	417	420	373	383	370	336	180	47	7	0	0	0
		0	*410*	*420*	*444*	*436*	*339*	*377*	*376*	*345*	*297*	*132*	*23*	*4*	*0*	*0*	*0*
98	Allentown, Pa.	10	429	358	373	342	380	371	353	358	205	124	36	16	3	0	0
		45	*405*	*354*	*354*	*327*	*362*	*376*	*374*	*337*	*188*	*88*	*67*	*13*	*4*	*2*	*0*
99	Altoona, Pa.	25	270	319	340	336	308	311	324	344	330	214	134	69	28	9	3
		28	*260*	*346*	*316*	*372*	*371*	*361*	*357*	*333*	*264*	*206*	*106*	*70*	*38*	*10*	*1*
100	Easton, Pa.	0	173	176	233	193	221	227	215	177	135	95	53	41	9	5	2
		0	*155*	*184*	*239*	*203*	*206*	*213*	*197*	*193*	*137*	*112*	*62*	*33*	*15*	*5*	*0*
101	Erie, Pa.	8	286	315	312	342	358	330	322	339	263	181	105	82	30	15	0
		18	*285*	*307*	*364*	*345*	*321*	*318*	*308*	*308*	*229*	*157*	*125*	*99*	*49*	*18*	*11*
102	Harrisburg, Pa.	35	309	341	410	372	403	484	421	378	352	243	164	119	64	20	2
		56	*305*	*359*	*410*	*394*	*437*	*423*	*398*	*415*	*299*	*214*	*156*	*105*	*52*	*31*	*3*
103	Lancaster, Pa.	24	218	267	277	278	345	293	290	298	197	92	45	13	0	2	0
		10	*184*	*269*	*303*	*287*	*298*	*236*	*267*	*284*	*196*	*130*	*61*	*25*	*8*	*0*	*0*
104	Newcastle, Pa.	4	223	255	248	269	228	234	253	204	151	144	83	43	19	5	3
		3	*227*	*257*	*307*	*246*	*254*	*221*	*261*	*213*	*177*	*144*	*105*	*80*	*37*	*13*	*3*
105	Norristown, Pa.	0	143	132	148	149	155	141	148	155	142	85	60	36	8	*2*	*0*
		0	*117*	*128*	*151*	*146*	*162*	*156*	*177*	*145*	*108*	*88*	*48*	*37*	*15*	*5*	*0*

[1] Elementary schools only reported.

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TABLE 3.—*Distribution, by age, of pupils in the public schools (elementary and secondary) in certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Age.															
		5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
106	Philadelphia, Pa.	500	6,070	7,122	7,860	7,565	7,772	7,461	7,609	7,152	4,548	2,605	1,603	943	446	125	30
		505	*6,028*	*7,096*	*8,134*	*7,460*	*7,897*	*7,698*	*7,779*	*6,994*	*4,368*	*2,565*	*1,531*	*822*	*375*	*100*	*30*
107	Pittsburg, Pa.	295	2,132	2,185	2,330	2,262	2,215	2,135	2,267	2,167	1,720	1,049	506	270	87	44	17
		318	*2,087*	*2,205*	*2,289*	*2,231*	*2,297*	*2,150*	*2,220*	*1,891*	*1,550*	*1,027*	*518*	*246*	*119*	*36*	*13*
108	Reading, Pa.	0	410	459	609	582	589	589	596	552	238	170	97	64	41	16	4
		0	*537*	*529*	*614*	*566*	*573*	*539*	*561*	*445*	*280*	*181*	*117*	*57*	*28*	*14*	*0*
109	Wilkes-Barre, Pa.	11	562	447	451	467	465	430	394	335	267	215	103	73	30	13	4
		14	*488*	*405*	*468*	*414*	*430*	*433*	*423*	*331*	*287*	*205*	*105*	*65*	*40*	*8*	*2*
110	Williamsport, Pa.	0	214	241	224	251	269	287	257	248	209	106	85	62	57	24	11
		0	*241*	*242*	*230*	*244*	*311*	*251*	*272*	*257*	*209*	*122*	*94*	*80*	*67*	*40*	*27*
111	York, Pa.	10	262	335	311	305	299	328	329	322	219	137	74	42	14	0	0
		19	*285*	*285*	*331*	*292*	*331*	*310*	*323*	*266*	*192*	*137*	*79*	*45*	*13*	*2*	*1*
112	Newport, R. I.	58	139	157	183	155	152	153	154	157	158	108	67	44	11	9	95
		87	*128*	*125*	*147*	*140*	*147*	*145*	*158*	*179*	*147*	*101*	*78*	*53*	*28*	*8*	*2*
113	Providence, R. I.	19	971	1,296	1,348	1,325	1,333	1,320	1,349	1,292	988	570	311	191	92	26	17
		16	*996*	*1,275*	*1,360*	*1,325*	*1,231*	*1,339*	*1,330*	*1,338*	*967*	*682*	*363*	*231*	*86*	*30*	*6*
114	Warwick, R. I.	89	160	158	158	147	148	151	172	163	123	70	28	12	12	1	0
		92	*141*	*170*	*159*	*141*	*174*	*156*	*183*	*121*	*84*	*55*	*37*	*26*	*9*	*5*	*0*
115	Woonsocket, R. I.	107	189	178	168	136	149	144	180	214	139	64	30	25	5	1	0
		86	*152*	*172*	*173*	*138*	*165*	*140*	*190*	*189*	*116*	*57*	*47*	*27*	*3*	*0*	*1*
116	Columbia, S. C.	0	38	89	75	89	72	97	73	62	51	52	34	14	4	0	0
		0	*46*	*77*	*81*	*97*	*91*	*94*	*97*	*89*	*67*	*74*	*42*	*22*	*2*	*0*	*0*
117	Nashville, Tenn.	0	0	754	851	794	792	754	767	674	552	406	219	83	44	14	5
		0	*0*	*739*	*882*	*790*	*820*	*841*	*859*	*816*	*646*	*479*	*309*	*168*	*65*	*8*	*3*
118	Dallas, Tex.	0	24	477	523	508	496	476	437	404	309	183	127	64	32	10	2
		1	*30*	*549*	*574*	*510*	*527*	*499*	*521*	*547*	*432*	*331*	*192*	*115*	*57*	*20*	*4*
119	Galveston, Tex.	0	0	224	195	218	222	213	190	156	115	59	31	10	4	1	0
		0	*0*	*242*	*231*	*200*	*213*	*212*	*203*	*181*	*175*	*110*	*76*	*24*	*18*	*0*	*0*
120	Houston, Tex.	1	18	385	490	514	437	458	431	410	310	245	141	38	23	0	1
		0	*39*	*400*	*475*	*479*	*464*	*403*	*397*	*345*	*337*	*238*	*159*	*78*	*16*	*3*	*0*
121	San Antonio, Tex.	1	38	452	581	559	535	560	568	441	386	199	137	65	19	5	1
		0	*24*	*411*	*582*	*523*	*559*	*572*	*573*	*517*	*404*	*265*	*179*	*66*	*36*	*3*	*0*
122	Salt Lake City, Utah	25	561	686	748	659	754	727	763	674	567	438	233	127	68	37	10
		29	*589*	*672*	*756*	*753*	*711*	*708*	*708*	*638*	*631*	*458*	*289*	*165*	*66*	*13*	*8*
123	Lynchburg, Va.	0	6	207	214	164	213	180	209	177	137	104	54	32	6	6	0
		0	*11*	*144*	*185*	*171*	*197*	*173*	*165*	*179*	*155*	*119*	*86*	*56*	*19*	*10*	*2*
124	Seattle, Wash.	31	750	1,002	1,143	1,124	1,125	1,080	1,200	1,166	1,111	944	587	428	286	177	92
		22	*626*	*941*	*1,048*	*1,043*	*1,115*	*1,189*	*1,229*	*1,195*	*1,110*	*934*	*711*	*460*	*237*	*1,112*	*39*

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125	Spokane, Wash.	14	438	578	604	565	549	575	601	573	555	369	247	178	129	62	29
		17	*467*	*511*	*599*	*567*	*530*	*524*	*612*	*572*	*501*	*432*	*315*	*234*	*139*	*56*	*22*
126	Tacoma, Wash.	0	399	466	497	484	493	515	565	503	497	216	170	142	76	29	10
		0	*361*	*450*	*501*	*402*	*433*	*484*	*492*	*447*	*455*	*339*	*226*	*164*	*71*	*24*	*4*
127	Green Bay, Wis.	170	141	174	157	163	153	127	140	128	125	88	61	44	16	5	1
		178	*188*	*204*	*152*	*153*	*144*	*111*	*141*	*146*	*120*	*93*	*60*	*38*	*11*	*2*	*6*
128	La Crosse, Wis.	73	148	194	179	200	172	198	204	194	178	116	106	44	30	10	2
		76	*158*	*181*	*181*	*198*	*180*	*181*	*192*	*186*	*145*	*127*	*80*	*46*	*33*	*10*	*5*
129	Madison, Wis.	12	129	150	127	156	139	148	152	132	124	100	80	54	23	8	5
		9	*129*	*114*	*167*	*146*	*169*	*145*	*118*	*158*	*119*	*130*	*113*	*59*	*23*	*15*	*0*
130	Racine, Wis.	1	218	241	248	266	264	290	255	247	179	116	52	37	15	8	5
		1	*246*	*209*	*241*	*201*	*236*	*255*	*262*	*234*	*143*	*117*	*58*	*56*	*31*	*4*	*2*
131	Sheboygan, Wis.	12	139	146	155	154	162	145	141	133	135	64	34	22	13	5	3
		15	*130*	*162*	*136*	*142*	*122*	*134*	*153*	*114*	*107*	*59*	*39*	*31*	*11*	*2*	*1*
132	Superior, Wis.	19	169	273	233	214	267	224	242	233	161	134	78	39	27	12	4
		6	*160*	*225*	*244*	*269*	*233*	*213*	*217*	*190*	*151*	*147*	*75*	*51*	*18*	*9*	*0*

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TABLE 4.—*Distribution, by age, of pupils in public schools (elementary and secondary) in certain cities of less than 25,000 population.*

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
1	Fort Smith, Ark	5	138	145	150	158	156	145	153	152	125	95	73	27	10	3	0
		6	*121*	*146*	*157*	*150*	*147*	*140*	*150*	*151*	*152*	*121*	*79*	*48*	*18*	*5*	*1*
2	Hot Springs, Ark	3	125	145	123	118	121	135	103	106	109	77	34	18	4	7	0
		8	*136*	*136*	*157*	*133*	*157*	*133*	*147*	*126*	*107*	*92*	*64*	*20*	*5*	*0*	*0*
3	Alameda, Cal	2	80	136	150	149	152	156	180	154	161	119	77	46	25	11	5
		2	*55*	*139*	*149*	*156*	*170*	*159*	*160*	*179*	*168*	*152*	*114*	*62*	*28*	*9*	*1*
4	Fresno, Cal	0	108	201	207	186	199	178	166	198	146	118	109	59	45	20	14
		0	*127*	*176*	*229*	*178*	*146*	*170*	*192*	*183*	*183*	*116*	*93*	*61*	*34*	*13*	8
5	Pasadena, Cal	0	173	160	173	182	220	183	168	206	204	173	105	87	51	18	18
		0	*150*	*154*	*198*	*180*	*214*	*175*	*198*	*208*	*199*	*185*	*152*	*103*	*47*	*33*	*10*
6	Riverside, Cal	3	78	97	81	89	121	100	102	113	93	81	70	47	22	14	8
		2	*69*	*99*	*104*	*97*	*105*	*108*	*104*	*88*	*106*	*87*	*75*	*40*	*36*	*9*	*4*
7	Santa Barbara, Cal	0	12	49	64	61	60	70	83	60	55	49	44	19	22	2	5
		0	*9*	*52*	*59*	*60*	*71*	*77*	*51*	*62*	*72*	*58*	*55*	*42*	*11*	*5*	*4*
8	Santa Cruz, Cal	0	47	77	70	70	73	68	69	54	79	45	33	25	8	6	2
		0	*51*	*65*	*72*	*65*	*76*	*89*	*76*	*81*	*77*	*59*	*44*	*27*	*17*	*2*	*4*
9	Stockton, Cal	3	104	113	113	139	129	116	124	137	128	100	61	45	18	1	0
		13	*97*	*77*	*121*	*103*	*103*	*120*	*130*	*130*	*105*	*89*	*72*	*53*	*20*	*10*	*0*
10	Vallejo, Cal	1	43	68	68	50	65	78	55	60	37	27	16	4	9	4	4
		1	*39*	*44*	*60*	*60*	*69*	*59*	*38*	*64*	*44*	*41*	*30*	*15*	*10*	7	*2*
11	Canon City, Colo	0	28	36	57	39	50	46	58	37	39	36	25	12	8	7	2
		0	*25*	*30*	*28*	*41*	*33*	*37*	*43*	*37*	*47*	*30*	*30*	*15*	*15*	*4*	*2*
12	Grand Junction, Colo	0	65	74	72	65	78	60	67	74	72	56	40	29	15	15	9
		0	*50*	*63*	*70*	*52*	*67*	*67*	*58*	*76*	*67*	*58*	*54*	*37*	*17*	*9*	*6*
13	Ansonia, Conn.[1]	82	128	124	139	135	123	115	149	108	75	32	10	2	0	0	0
		80	*125*	*131*	*136*	*127*	*125*	*125*	*133*	*106*	*51*	*16*	*5*	*1*	*0*	*0*	*0*
14	Danbury, Conn	58	102	129	133	120	120	116	142	137	104	80	43	30	8	2	0
		44	*91*	*103*	*125*	*123*	*120*	*97*	*130*	*121*	*108*	*64*	*49*	*37*	*16*	*1*	*0*
15	Middletown, Conn	30	38	69	70	61	63	57	62	79	87	85	59	34	19	5	1
		24	*42*	*46*	*46*	*45*	*41*	*55*	*64*	*65*	*72*	*73*	*49*	*44*	*21*	*5*	*1*
16	Naugatuck, Conn	25	72	115	82	92	101	83	90	103	84	35	22	11	6	6	2
		41	*78*	*85*	*106*	*93*	*99*	*97*	*97*	*75*	*69*	*33*	*23*	*16*	*8*	*0*	*0*
17	Torrington, Conn	55	73	91	77	86	57	103	98	84	47	41	24	15	2	3	0
		69	*74*	*98*	*76*	*80*	*80*	*83*	*91*	*67*	*49*	*40*	*29*	*12*	*16*	7	*0*
18	Wallingford, Conn	95	89	100	113	92	87	100	83	80	64	50	15	9	3	0	0
		86	*75*	*101*	*99*	*90*	*90*	*104*	*100*	*68*	*60*	*44*	*37*	*11*	*6*	*0*	*0*
19	Pensacola, Fla	0	135	131	165	147	135	126	115	103	79	51	25	4	0	0	0
		0	*166*	*146*	*189*	*166*	*163*	*149*	*171*	*142*	*102*	*85*	*39*	*21*	*10*	*2*	*2*
20	Athens, Ga	7	56	59	72	73	82	57	65	63	48	37	18	9	0	0	0
		0	*42*	*53*	*68*	*66*	*73*	*68*	*85*	*78*	*53*	*38*	*24*	*10*	*0*	*0*	*0*

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21	Columbus, Ga.	0	104	140	174	154	165	160	128	141	95	62	34	20	6	1	0
		0	*73*	*132*	*150*	*140*	*194*	*168*	*163*	*145*	*113*	*96*	*59*	*26*	*6*	*0*	*0*
22	Dalton, Ga.	2	33	39	56	42	49	47	59	48	38	29	13	10	3	0	0
		1	*57*	*49*	*43*	*68*	*53*	*44*	*44*	*36*	*58*	*38*	*16*	*12*	*4*	*2*	*1*
23	Lagrange, Ga.	0	65	59	54	39	59	43	46	40	30	22	11	7	2	2	0
		1	*51*	*60*	*65*	*46*	*65*	*51*	*55*	*53*	*31*	*25*	*21*	*9*	*2*	*1*	*0*
24	Pocatello, Idaho	0	56	60	47	41	40	44	54	46	47	25	14	8	3	1	9
		0	*46*	*62*	*49*	*58*	*53*	*54*	*50*	*47*	*46*	*32*	*23*	*5*	*1*	*1*	*0*
25	Alton, Ill.	0	85	107	102	107	108	87	147	104	78	56	28	19	8	9	1
		0	*65*	*123*	*97*	*87*	*123*	*110*	*130*	*138*	*110*	*72*	*41*	*46*	*15*	*0*	*2*
26	Belleville, Ill.	0	118	147	164	150	129	129	148	175	118	46	28	6	3	0	0
		0	*148*	*140*	*128*	*147*	*163*	*137*	*145*	*145*	*62*	*52*	*17*	*12*	*2*	*0*	*0*
27	Canton, Ill.	0	76	66	93	84	86	91	86	90	73	51	32	24	4	0	2
		0	*77*	*76*	*82*	*64*	*91*	*66*	*79*	*96*	*61*	*49*	*54*	*22*	*10*	*5*	*0*
28	Centralia, Ill.[1]	2	78	70	81	70	82	82	85	68	59	33	7	1	0	0	0
		0	*69*	*74*	*87*	*74*	*97*	*69*	*77*	*95*	*48*	*26*	*10*	*2*	*0*	*0*	*0*
29	Champaign, Ill.[1]	0	89	74	82	83	81	54	70	77	50	27	7	0	0	0	0
		0	*97*	*68*	*75*	*88*	*74*	*84*	*77*	*74*	*47*	*25*	*6*	*0*	*0*	*0*	*0*
30	Chicago Heights, Ill.[1]	0	91	90	88	86	79	85	75	74	46	18	3	4	0	0	0
		0	*74*	*77*	*109*	*77*	*71*	*50*	*50*	*65*	*37*	*17*	*19*	*0*	*0*	*0*	*0*
31	Clinton, Ill.	0	52	48	60	43	58	53	45	42	47	39	32	16	10	3	3
		0	*50*	*46*	*54*	*57*	*56*	*42*	*48*	*48*	*55*	*34*	*37*	*18*	*17*	*8*	*2*
32	De Kalb, Ill.[1]	0	54	74	62	66	63	51	80	59	47	16	2	1	0	0	0
		0	*56*	*60*	*73*	*74*	*74*	*60*	*62*	*71*	*35*	*15*	*1*	*0*	*0*	*0*	*0*
33	Evanston (Dist. No. 76), Ill.[1]	1	62	57	42	50	58	52	57	58	37	20	7	1	0	0	0
		0	*42*	*60*	*55*	*55*	*54*	*49*	*38*	*53*	*35*	*20*	*3*	*1*	*0*	*0*	*0*
34	Evanston (Dist. No. 75), Ill.[1]	0	102	120	113	119	110	103	109	106	65	33	20	0	1	0	0
		0	*85*	*103*	*102*	*95*	*94*	*114*	*110*	*75*	*77*	*22*	*13*	*0*	*1*	*0*	*0*
35	Freeport, Ill.	0	41	114	100	98	124	114	122	135	111	83	76	31	25	8	6
		0	*44*	*105*	*98*	*96*	*116*	*117*	*130*	*107*	*126*	*90*	*89*	*64*	*44*	*19*	*7*
36	Galesburg, Ill.	0	125	142	135	139	156	169	162	154	141	109	79	44	30	9	3
		0	*136*	*130*	*145*	*150*	*170*	*140*	*157*	*164*	*129*	*127*	*151*	*92*	*41*	*8*	*1*
37	Jacksonville, Ill.	1	65	65	90	93	89	80	73	90	87	64	51	29	16	9	6
		0	*76*	*93*	*92*	*73*	*95*	*83*	*106*	*98*	*74*	*61*	*74*	*51*	*29*	*12*	*6*
38	Kankakee, Ill.	0	90	99	90	96	79	78	88	101	89	41	25	11	5	3	1
		0	*99*	*99*	*84*	*86*	*90*	*86*	*102*	*98*	*67*	*44*	*29*	*20*	*6*	*2*	*0*
39	La Salle, Ill.[1]	0	64	97	97	36	53	72	26	53	16	4	1	0	0	0	0
		0	*61*	*94*	*90*	*59*	*28*	*48*	*78*	*32*	*5*	*4*	*0*	*0*	*0*	*0*	*0*
40	Macomb, Ill.	1	28	35	40	44	40	33	40	33	32	31	22	15	6	4	0
		3	*35*	*31*	*39*	*33*	*46*	*36*	*37*	*40*	*38*	*31*	*27*	*31*	*4*	*3*	*0*
41	Mattoon, Ill.	6	107	96	122	100	89	91	120	95	71	54	34	12	14	7	1
		4	*113*	*95*	*103*	*86*	*111*	*112*	*98*	*76*	*79*	*58*	*45*	*18*	*9*	*2*	*1*
42	Maywood and Melrose Park, Ill.	0	64	99	106	95	141	91	85	88	82	50	37	14	1	1	0
		0	*68*	*89*	*111*	*96*	*85*	*97*	*82*	*72*	*57*	*48*	*35*	*16*	*3*	*1*	*0*
43	Moline, Ill.	2	94	139	145	155	146	157	152	149	123	71	54	30	15	5	0
		0	*126*	*128*	*134*	*123*	*160*	*142*	*140*	*120*	*126*	*62*	*55*	*31*	*20*	*4*	*0*
44	Ottawa, Ill.[1]	3	68	84	72	77	64	76	74	70	44	16	9	0	0	0	0
		2	*63*	*82*	*71*	*83*	*67*	*76*	*82*	*78*	*57*	*19*	*6*	*0*	*0*	*0*	*0*
45	Pekin, Ill.	0	91	83	83	69	67	71	78	66	66	48	29	15	13	1	0
		0	*88*	*72*	*79*	*95*	*94*	*77*	*74*	*58*	*61*	*46*	*33*	*22*	*6*	*1*	*1*

[1] Elementary schools only reported

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TABLE 4.—*Distribution, by age, of pupils in public schools (elementary and secondary) in certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
46	Rock Island, Ill	24	162	146	155	161	169	133	163	142	117	72	47	25	18	6	1
		27	*139*	*155*	*168*	*156*	*168*	*174*	*155*	*156*	*106*	*77*	*50*	*52*	*6*	*0*	*0*
47	Streator, Ill.[1]	0	106	134	118	111	127	114	106	102	48	11	3	0	0	0	0
		0	*104*	*115*	*131*	*108*	*118*	*95*	*100*	*99*	*67*	*25*	*3*	*0*	*0*	*0*	*0*
48	Waukegan, Ill.[1]	1	84	113	111	92	84	93	91	85	59	22	5	1	0	0	0
		0	*91*	*94*	*96*	*82*	*111*	*89*	*105*	*88*	*48*	*22*	*7*	*2*	*0*	*0*	*0*
49	Alexandria, Ind	8	32	38	42	39	35	30	35	26	28	27	13	14	9	7	1
		3	*34*	*43*	*50*	*32*	*45*	*35*	*40*	*49*	*42*	*32*	*12*	*18*	*8*	*3*	*0*
50	Bedford, Ind.[1]	0	63	82	75	80	77	70	91	79	57	27	7	3	0	0	0
		0	*69*	*67*	*67*	*82*	*68*	*75*	*73*	*62*	*41*	*18*	*2*	*1*	*0*	*0*	*0*
51	Connersville, Ind	0	42	50	38	45	51	40	57	38	45	26	16	14	12	6	1
		0	*43*	*60*	*57*	*55*	*57*	*55*	*45*	*50*	*58*	*38*	*34*	*13*	*6*	*1*	*1*
52	Crawfordsville, Ind	1	49	53	74	56	70	60	74	64	68	48	31	32	18	7	3
		0	*45*	*60*	*77*	*71*	*64*	*68*	*69*	*67*	*42*	*58*	*33*	*34*	*18*	*4*	*4*
53	East Chicago, Ind	5	87	95	80	89	88	104	57	52	36	22	19	7	4	0	0
		7	*15*	*46*	*59*	*97*	*74*	*81*	*75*	*51*	*24*	*22*	*7*	*7*	*2*	*2*	*0*
54	Frankfort, Ind	0	66	76	99	88	88	94	81	89	78	44	41	27	18	9	2
		0	*62*	*63*	*86*	*92*	*66*	*76*	*98*	*105*	*73*	*54*	*41*	*31*	*13*	*6*	*1*
55	Goshen, Ind	0	45	65	60	69	69	74	56	64	57	54	42	31	16	6	5
		0	*45*	*70*	*63*	*55*	*55*	*84*	*79*	*54*	*53*	*35*	*32*	*29*	*15*	*6*	*0*
56	Kokomo, Ind	0	104	117	130	118	116	108	120	106	83	79	59	33	21	10	0
		1	*115*	*151*	*129*	*136*	*163*	*140*	*146*	*105*	*73*	*73*	*43*	*49*	*32*	*10*	*2*
57	La Porte, Ind	1	39	46	55	39	42	43	49	58	60	38	20	15	5	0	1
		0	*34*	*52*	*45*	*50*	*51*	*45*	*54*	*55*	*50*	*38*	*41*	*31*	*12*	*2*	*1*
58	Lebanon, Ind	0	38	31	40	43	45	35	32	42	49	48	41	31	22	9	3
		0	*44*	*41*	*44*	*54*	*51*	*57*	*46*	*50*	*33*	*51*	*45*	*18*	*20*	*9*	*2*
59	Logansport, Ind	0	109	106	128	120	124	131	114	115	101	91	64	41	17	8	3
		0	*100*	*94*	*116*	*108*	*134*	*95*	*104*	*102*	*104*	*106*	*87*	*41*	*37*	*15*	*3*
60	Michigan City, Ind	1	69	113	110	97	114	80	106	101	99	49	38	26	11	1	1
		3	*94*	*81*	*107*	*92*	*98*	*97*	*83*	*93*	*75*	*50*	*26*	*25*	*10*	*0*	*0*
61	Peru, Ind	2	62	89	100	85	92	86	90	95	71	41	24	13	2	2	0
		10	*64*	*85*	*99*	*73*	*79*	*83*	*75*	*83*	*62*	*49*	*42*	*22*	*22*	*3*	*0*
62	Wabash, Ind	0	54	86	76	77	92	79	68	82	62	40	34	23	10	2	1
		0	*51*	*71*	*89*	*77*	*75*	*84*	*80*	*80*	*68*	*49*	*45*	*41*	*9*	*1*	*0*
63	Clinton, Iowa	1	35	84	98	111	118	115	100	125	103	68	42	27	15	7	2
		0	*43*	*70*	*132*	*97*	*110*	*121*	*105*	*129*	*101*	*69*	*43*	*48*	*24*	*10*	*4*
64	Creston, Iowa	14	47	56	67	55	68	50	66	50	49	25	24	13	11	4	3
		9	*47*	*66*	*44*	*54*	*49*	*51*	*50*	*53*	*60*	*41*	*38*	*32*	*9*	*2*	0
65	Iowa City, Iowa[1]	25	51	62	52	54	44	53	59	47	40	16	8	0	0	0	0
		25	*52*	*46*	*63*	*43*	*58*	*71*	*46*	*49*	*34*	*16*	*6*	*1*	*0*	*0*	0

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66	Keokuk, Iowa	43	73	102	76	77	84	89	82	96	85	51	29	20	9	3	2
		39	*76*	*72*	*77*	*82*	*94*	*91*	*95*	*91*	*72*	*55*	*47*	*26*	*15*	*4*	*1*
67	Marshalltown, Iowa	1	62	98	102	97	84	93	88	97	77	53	33	24	18	7	4
		1	*79*	*103*	*109*	*105*	*95*	*95*	*108*	*105*	*84*	*75*	*66*	*41*	*18*	*8*	*2*
68	Mason City, Iowa	0	42	76	81	83	72	79	81	73	59	50	32	12	15	3	2
		1	*47*	*55*	*88*	*752*	*56*	*77*	*74*	*69*	*118*	*67*	*41*	*32*	*15*	*4*	*0*
69	Muscatine, Iowa	33	67	70	87	78	91	94	102	93	78	41	29	25	18	8	4
		30	*65*	*72*	*98*	*79*	*85*	*106*	*121*	*106*	*65*	*45*	*20*	*24*	*19*	*6*	*2*
70	Oskaloosa, Iowa	4	40	65	68	71	73	81	88	72	59	48	29	19	8	6	2
		4	*32*	*65*	*83*	*74*	*58*	*68*	*70*	*73*	*92*	*59*	*31*	*24*	*18*	*5*	*4*
71	Ottumwa, Iowa	120	199	192	176	166	230	165	167	181	121	87	55	29	17	6	0
		120	*185*	*176*	*219*	*186*	*193*	*193*	*182*	*184*	*149*	*110*	*72*	*45*	*23*	*11*	*2*
72	Arkansas City, Kans	1	51	67	54	55	60	69	55	76	50	46	37	24	15	5	1
		0	*63*	*48*	*61*	*71*	*52*	*46*	*55*	*59*	*48*	*56*	*39*	*15*	*17*	*6*	*3*
73	Emporia, Kans.	0	33	53	56	49	60	65	71	67	53	60	51	33	26	14	12
		0	*38*	*47*	*91*	*71*	*67*	*61*	*98*	*80*	*64*	*71*	*71*	*51*	*18*	*18*	*4*
74	Hutchinson, Kans.	0	83	109	126	91	127	117	99	101	88	78	45	28	21	9	6
		0	*77*	*82*	*107*	*99*	*109*	*95*	*108*	*112*	*107*	*87*	*71*	*33*	*17*	*6*	*1*
75	Parsons, Kans.	0	82	71	94	77	94	78	76	103	75	54	34	25	14	1	1
		0	*79*	*92*	*91*	*92*	*87*	*80*	*80*	*78*	*82*	*76*	*65*	*26*	*21*	*5*	*2*
76	Owenboro, Ky	0	45	66	82	80	84	84	76	79	88	62	38	12	8	4	1
		0	*50*	*78*	*82*	*76*	*93*	*83*	*77*	*101*	*71*	*75*	*42*	*36*	*10*	*1*	*0*
77	Shreveport, La.	0	60	74	100	90	101	105	74	77	76	61	31	13	9	0	0
		1	*68*	*79*	*114*	*98*	*111*	*103*	*97*	*90*	*91*	*69*	*38*	*22*	*6*	*1*	*0*
78	Bangor, Me.	98	143	164	137	133	137	123	133	129	142	102	75	54	28	7	2
		65	*109*	*93*	*109*	*155*	*154*	*230*	*99*	*139*	*100*	*122*	*78*	*86*	*63*	*8*	*1*
79	Waterville, Me.	5	31	49	60	58	75	60	71	86	38	39	22	15	3	2	0
		6	*37*	*51*	*65*	*59*	*49*	*68*	*70*	*66*	*49*	*44*	*26*	*20*	*6*	*3*	*0*
80	Cumberland, Md	0	117	105	144	128	153	146	120	140	103	45	19	11	4	2	0
		0	*131*	*143*	*178*	*154*	*161*	*156*	*148*	*136*	*115*	*58*	*30*	*23*	*11*	*1*	*0*
81	Hagerstown, Md	0	58	115	111	111	139	113	127	105	70	47	49	26	3	5	0
		0	*97*	*104*	*128*	*101*	*124*	*108*	*114*	*90*	*71*	*66*	*45*	*20*	*10*	*10*	*1*
82	Adams, Mass.	46	96	85	88	74	102	86	96	68	46	35	22	6	11	7	5
		34	*76*	*74*	*99*	*105*	*78*	*89*	*78*	*95*	*41*	*27*	*26*	*19*	*11*	*5*	*1*
83	Attleboro, Mass.	68	125	126	111	94	109	115	112	122	72	54	24	17	7	1	0
		64	*107*	*119*	*109*	*106*	*100*	*116*	*112*	*120*	*175*	*45*	*35*	*19*	*6*	*1*	*1*
84	Beverly, Mass.	114	124	130	133	125	143	141	134	115	118	84	49	42	14	12	0
		105	*119*	*126*	*149*	*122*	*137*	*135*	*144*	*119*	*106*	*89*	*76*	*64*	*28*	*11*	*3*
85	Danvers, Mass.	41	63	61	70	73	63	69	76	85	66	48	27	18	4	0	0
		48	*53*	*61*	*66*	*61*	*71*	*75*	*66*	*73*	*68*	*43*	*35*	*25*	*5*	*1*	*0*
86	Dedham, Mass.	65	74	83	78	72	67	66	71	60	54	29	67	15	8	1	0
		75	*104*	*70*	*51*	*70*	*58*	*87*	*81*	*61*	*58*	*42*	*34*	*17*	*10*	*1*	*0*
87	Framingham, Mass.	74	92	90	102	86	126	96	100	99	104	62	40	28	8	3	1
		65	*95*	*93*	*89*	*87*	*100*	*108*	*109*	*99*	*78*	*50*	*30*	*36*	*16*	*5*	*1*
88	Gardner, Mass.	54	88	93	81	76	83	77	85	64	61	52	38	24	14	3	1
		46	*85*	*87*	*89*	*63*	*90*	*77*	*68*	*86*	*62*	*42*	*40*	*34*	*21*	*7*	*2*
89	Marlborough, Mass.	33	117	132	111	106	101	86	136	123	113	56	39	23	15	1	0
		38	*81*	*118*	*121*	*90*	*99*	*117*	*119*	*115*	*94*	*75*	*57*	*45*	*17*	*2*	*0*
90	Melrose, Mass.	84	119	133	128	131	118	150	166	130	104	99	60	53	24	12	3
		102	*113*	*139*	*128*	*149*	*147*	*140*	*151*	*151*	*115*	*101*	*90*	*60*	*38*	*11*	*3*

[1] Elementary schools only reported.

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TABLE 4.—*Distribution, by age, of pupils in public schools (elementary and secondary) in certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
91	Medford, Mass	157	173	177	184	167	181	197	177	181	152	106	60	37	14	5	1
		162	*180*	*181*	*159*	*190*	*189*	*205*	*174*	*175*	*156*	*81*	*66*	*50*	*17*	*2*	*2*
92	Milford, Mass	90	117	89	96	80	97	79	80	92	73	41	28	12	2	4	1
		93	*123*	*101*	*91*	*83*	*75*	*89*	*91*	*68*	*56*	*32*	*34*	*19*	*12*	*0*	*0*
93	Montague, Mass	61	46	44	55	48	54	56	55	58	48	26	13	10	6	0	0
		41	*43*	*59*	*38*	*51*	*54*	*40*	*49*	*49*	*27*	*30*	*12*	*14*	*1*	*2*	*1*
94	Natick, Mass	47	79	56	79	78	84	66	76	76	64	44	42	22	8	5	2
		54	*61*	*80*	*82*	*69*	*99*	*82*	*72*	*77*	*59*	*60*	*40*	*33*	*8*	*3*	*0*
95	Newburyport, Mass	44	73	63	75	74	77	83	92	116	77	77	54	29	13	1	1
		65	*79*	*86*	*61*	*74*	*78*	*67*	*89*	*81*	*65*	*79*	*44*	*40*	*18*	*3*	*1*
96	North Attleboro, Mass	44	55	63	73	48	52	73	69	63	53	20	17	8	5	2	0
		38	*50*	*69*	*48*	*47*	*56*	*62*	*84*	*53*	*50*	*31*	*59*	*14*	*10*	*3*	*0*
97	Norwood, Mass	59	77	77	61	55	68	75	80	71	56	32	22	16	2	4	0
		49	*85*	*72*	*88*	*59*	*54*	*82*	*94*	*82*	*55*	*44*	*39*	*15*	*10*	*3*	0
98	Northbridge, Mass	0	86	79	79	74	84	74	81	68	36	22	13	4	8	3	0
		2	*71*	*73*	*75*	*87*	*66*	*75*	*65*	*64*	*36*	*20*	*25*	*8*	*5*	*0*	*0*
99	Peabody, Mass	65	91	77	86	100	99	88	113	96	88	57	45	17	16	4	0
		87	*79*	*75*	*85*	*89*	*97*	*89*	*105*	*77*	*61*	*45*	*32*	*25*	*15*	*6*	*0*
100	Revere, Mass	108	138	158	149	155	122	142	182	128	121	84	40	27	16	11	1
		97	*160*	*119*	*128*	*130*	*149*	*143*	*125*	*129*	*118*	*70*	*38*	*30*	*15*	*5*	*0*
101	Wakefield, Mass	78	83	80	90	96	97	112	115	94	76	68	50	33	15	7	0
		76	*87*	*103*	*79*	*82*	*96*	*102*	*118*	*89*	*88*	*58*	*50*	*28*	*15*	*16*	*0*
102	Westfield, Mass	35	67	102	83	96	97	75	114	71	98	51	41	18	8	0	0
		38	*81*	*100*	*92*	*96*	*103*	*97*	*85*	*77*	*81*	*66*	*58*	*31*	*17*	*7*	*0*
103	West Springfield, Mass	35	65	80	111	98	87	74	92	71	41	46	36	14	14	6	0
		28	*70*	*83*	*75*	*86*	*93*	*84*	*95*	*78*	*57*	*49*	*32*	*15*	*12*	*7*	*0*
104	Weymouth, Mass	85	88	96	106	74	77	77	110	115	100	113	42	30	20	5	0
		71	*55*	*77*	*114*	*87*	*110*	*68*	*87*	*111*	*109*	*78*	*62*	*48*	*25*	*9*	*0*
105	Winchester, Mass	64	75	75	82	81	90	83	86	70	56	41	26	16	7	5	0
		51	*59*	*86*	*104*	*85*	*75*	*82*	*72*	*62*	*50*	*44*	*40*	*22*	*10*	*2*	*0*
106	Winthrop, Mass	57	75	84	81	79	84	82	68	81	68	39	74	24	13	1	0
		50	*73*	*73*	*85*	*71*	*73*	*61*	*79*	*67*	*64*	*67*	*30*	*21*	*11*	*7*	*0*
107	Woburn, Mass	100	120	116	161	151	141	155	169	140	96	73	61	32	18	8	0
		123	*136*	*105*	*140*	*113*	*126*	*106*	*107*	*109*	*101*	*75*	*58*	*41*	*24*	*11*	*0*
108	Ann Arbor, Mich	29	65	91	89	98	83	100	97	94	94	69	68	59	68	42	51
		36	*98*	*69*	*71*	*88*	*78*	*83*	*89*	*97*	*88*	*88*	*83*	*67*	*44*	*21*	*16*
109	Cadillac, Mich	12	57	73	100	79	67	63	92	83	69	58	37	36	10	2	1
		10	*59*	*85*	*74*	*72*	*86*	*69*	*67*	*81*	*104*	*70*	*41*	*21*	*11*	*2*	*2*
110	Cheboygan, Mich	26	51	59	58	67	51	54	40	36	51	42	24	7	1	0	0
		21	*47*	*56*	*66*	*50*	*48*	*50*	*50*	*48*	*54*	*40*	*25*	*18*	*17*	*7*	*6*

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111	Escanaba, Mich	14	109	100	97	98	108	95	87	110	99	72	46	25	11	6	1
		8	*109*	*116*	*115*	*86*	*82*	*112*	*96*	*92*	*90*	*72*	*56*	*42*	*15*	*2*	*0*
112	Hancock, Mich	48	53	67	81	50	48	56	47	56	49	29	31	18	6	3	1
		36	*61*	*58*	*63*	*46*	*51*	*42*	*38*	*46*	*36*	*34*	*23*	*13*	*6*	*4*	*1*
113	Holland, Mich	1	74	81	76	73	78	77	75	70	66	35	23	12	6	2	1
		3	*68*	*86*	*92*	*83*	*70*	*79*	*101*	*84*	*62*	*49*	*21*	*15*	*6*	*3*	*1*
114	Iron Mountain, Mich	0	32	81	93	114	102	114	105	123	124	70	43	19	9	0	1
		0	*44*	*90*	*103*	*113*	*96*	*104*	*112*	*98*	*83*	*65*	*40*	*20*	*8*	*2*	*0*
115	Ironwood, Mich	7	77	116	109	104	106	97	92	77	85	63	35	24	1	3	0
		11	*96*	*113*	*119*	*103*	*99*	*82*	*110*	*85*	*58*	*49*	*32*	*12*	*4*	*0*	*0*
116	Ishpeming, Mich	7	104	115	61	141	103	111	112	104	109	85	54	32	10	3	2
		5	*98*	*123*	*110*	*106*	*100*	*101*	*115*	*107*	*111*	*82*	*70*	*35*	*3*	*3*	*0*
117	Lansing, Mich	3	126	153	129	153	165	171	174	154	150	128	85	40	17	2	0
		2	*138*	*161*	*135*	*174*	*181*	*147*	*130*	*135*	*161*	*132*	*124*	*39*	*11*	*1*	*0*
118	Marquette, Mich	48	94	92	100	79	82	82	68	60	92	74	35	14	7	1	0
		34	*90*	*88*	*89*	*81*	*79*	*65*	*71*	*80*	*87*	*53*	*41*	*20*	*5*	*0*	*0*
119	Menominee, Mich	3	85	112	118	94	88	63	93	98	92	70	31	24	9	2	0
		7	*74*	*100*	*90*	*82*	*74*	*68*	*80*	*82*	*91*	*75*	*49*	*31*	*13*	*5*	*0*
120	Muskegon, Mich	2	102	155	152	170	163	146	176	157	166	111	68	38	27	10	9
		3	*124*	*159*	*171*	*154*	*154*	*169*	*160*	*179*	*154*	*112*	*45*	*38*	*25*	*15*	*6*
121	Sault Ste. Marie, Mich	27	65	111	88	104	66	96	96	77	87	57	33	29	14	5	3
		0	*25*	*97*	*129*	*126*	*92*	*71*	*63*	*81*	*81*	*62*	*44*	*37*	*16*	*6*	*0*
122	Meridian, Mich	61	92	105	155	137	140	119	118	95	86	76	31	17	5	0	0
		62	*123*	*130*	*115*	*120*	*131*	*90*	*118*	*122*	*124*	*93*	*50*	*16*	*3*	*0*	*0*
123	Carthage, Mo	3	68	88	80	90	87	74	76	82	60	59	45	23	13	11	2
		1	*49*	*94*	*91*	*75*	*69*	*83*	*81*	*85*	*74*	*89*	*69*	*45*	*15*	*4*	*2*
124	Great Falls, Mont	0	114	110	105	117	128	107	101	96	83	81	47	33	8	4	7
		0	*78*	*117*	*119*	*116*	*98*	*131*	*93*	*99*	*111*	*89*	*51*	*37*	*20*	*5*	*5*
125	Concord, N. H	40	107	82	100	94	92	114	102	113	100	95	58	45	23	14	6
		38	*100*	*117*	*96*	*89*	*97*	*114*	*117*	*109*	*115*	*86*	*62*	*69*	*40*	*8*	*0*
126	Portsmouth, N. H	8	84	64	59	76	66	58	52	75	72	61	40	13	6	1	0
		7	*73*	*81*	*68*	*78*	*65*	*78*	*80*	*70*	*79*	*60*	*18*	*28*	*4*	*1*	*0*
127	Bloomfield, N. J	13	91	81	91	121	116	96	97	95	69	43	21	17	8	0	0
		11	*60*	*83*	*108*	*120*	*83*	*98*	*100*	*78*	*73*	*49*	*25*	*18*	*13*	*3*	*1*
128	Bridgeton, N. J	63	92	99	87	92	100	82	91	99	61	53	23	7	2	0	0
		77	*73*	*90*	*97*	*89*	*101*	*93*	*99*	*96*	*59*	*43*	*31*	*13*	*6*	*0*	*0*
129	Garfield, N. J.[1]	11	68	75	88	76	71	74	58	44	24	5	0	2	0	0	0
		17	*58*	*72*	*100*	*64*	*73*	*74*	*64*	*35*	*9*	*3*	*0*	*0*	*0*	*0*	*0*
130	Kearney, N. J	72	120	136	112	135	124	146	158	148	90	49	16	11	4	2	0
		81	*112*	*136*	*125*	*131*	*137*	*146*	*130*	*114*	*95*	*64*	*24*	*13*	*3*	*4*	*2*
131	Long Branch, N. J	26	54	82	97	85	100	81	86	98	103	119	67	33	13	6	2
		29	*82*	*89*	*110*	*84*	*88*	*70*	*115*	*123*	*121*	*77*	*56*	*32*	*15*	*3*	*0*
132	Irvington, N. J	38	70	82	82	92	93	90	75	87	52	35	15	1	2	0	0
		53	*104*	*71*	*69*	*71*	*80*	*89*	*76*	*60*	*43*	*29*	*11*	*5*	*0*	*0*	*0*
133	Montclair, N. J	42	87	114	136	120	159	125	147	120	142	94	86	67	29	16	2
		25	*110*	*100*	*109*	*117*	*127*	*102*	*118*	*126*	*123*	*103*	*83*	*77*	*27*	*11*	*3*
134	Morristown, N. J	18	50	58	63	59	65	64	57	64	75	54	30	7	6	6	0
		12	*42*	*45*	*65*	*57*	*72*	*75*	*53*	*52*	*42*	*56*	*29*	*30*	*5*	*8*	*1*
135	Plainfield, N. J	12	76	103	137	113	134	129	134	127	102	86	52	35	9	6	[illegible]
		21	*74*	*104*	*119*	*131*	*138*	*118*	*135*	*107*	*115*	*71*	*53*	*39*	*24*	*6*	*2*

[1] Elementary schools only reported.

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TABLE 4.—*Distribution, by age, of pupils in public schools (elementary and secondary) in certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
136	Town of Union, N. J.	17	134	115	149	168	158	133	139	152	142	104	53	16	7	1	0
		16	*115*	*136*	*158*	*179*	*157*	*113*	*123*	*154*	*135*	*91*	*35*	*12*	*4*	*0*	*0*
137	Vineland, N. J.	4	12	44	89	97	96	87	101	99	70	43	22	17	19	4	1
		10	*15*	*34*	*79*	*89*	*75*	*84*	*76*	*72*	*78*	*46*	*43*	*31*	*15*	*6*	*2*
138	West New York, N. J.[1]	24	121	137	125	103	128	99	123	76	52	6	1	0	0	0	0
		33	*117*	*120*	*139*	*110*	*139*	*126*	*113*	*79*	*44*	*6*	*0*	*0*	*0*	*0*	*0*
139	West Orange, N. J.	6	49	79	92	81	85	75	84	64	53	27	15	10	0	0	0
		12	*54*	*80*	*85*	*58*	*76*	*75*	*57*	*65*	*50*	*35*	*12*	*7*	*0*	*1*	*0*
140	Albuquerque, N. Mex.	0	68	67	72	73	73	75	77	79	69	40	20	12	7	1	1
		0	*46*	*68*	*85*	*67*	*80*	*71*	*72*	*66*	*41*	*41*	*38*	*14*	*7*	*2*	*1*
141	Amsterdam, N. Y.[1]	5	125	142	132	155	157	146	124	137	56	21	2	1	0	0	0
		9	*96*	*147*	*151*	*150*	*144*	*162*	*161*	*152*	*73*	*14*	*1*	*0*	*0*	*0*	*0*
142	Dunkirk, N. Y.	36	83	69	89	103	79	64	56	80	77	64	32	22	11	3	2
		1	*58*	*140*	*119*	*83*	*66*	*61*	*64*	*80*	*73*	*38*	*35*	*29*	*10*	*2*	*1*
143	Gloversville, N. Y.	43	94	106	140	137	152	155	137	140	97	78	35	28	18	4	0
		39	*89*	*92*	*117*	*144*	*113*	*147*	*136*	*134*	*104*	*68*	*47*	*24*	*26*	*11*	*1*
144	Johnstown, N. Y.	4	33	55	75	66	76	72	87	85	81	49	23	19	9	2	0
		1	*39*	*48*	*51*	*77*	*69*	*76*	*83*	*69*	*66*	*42*	*35*	*23*	*17*	*10*	*5*
145	New Rochelle, N. Y.	38	162	196	250	196	209	219	216	190	176	89	65	33	16	4	2
		33	*154*	*168*	*187*	*177*	*189*	*192*	*191*	*187*	*142*	*86*	*58*	*29*	*6*	*5*	*0*
146	Olean, N. Y.	11	49	86	95	98	109	127	106	116	89	57	46	42	13	7	6
		7	*61*	*110*	*116*	*100*	*93*	*108*	*92*	*89*	*84*	*69*	*65*	*48*	*18*	*8*	*2*
147	Port Chester, N. Y.	6	74	103	112	95	113	105	88	87	71	45	18	13	7	2	1
		8	*67*	*100*	*123*	*92*	*109*	*103*	*83*	*90*	*66*	*43*	*22*	*16*	*10*	*0*	*1*
148	White Plains, N. Y.	6	26	74	82	87	120	83	81	78	70	58	42	18	13	3	2
		31	*61*	*101*	*85*	*105*	*89*	*99*	*95*	*86*	*54*	*50*	*47*	*31*	*8*	*3*	*1*
149	Asheville, N. C.[1]	0	127	128	137	172	161	131	143	118	108	50	22	4	1	1	0
		0	*101*	*108*	*135*	*129*	*177*	*158*	*138*	*160*	*101*	*61*	*19*	*9*	*1*	*0*	*0*
150	Newbern, N. C.	0	41	39	61	50	57	62	45	61	37	24	10	4	1	1	0
		0	*48*	*71*	*57*	*76*	*76*	*58*	*86*	*67*	*48*	*39*	*16*	*14*	*4*	*2*	*0*
151	Alliance, Ohio.	0	63	111	141	118	98	111	103	121	123	97	59	19	6	2	0
		0	*67*	*141*	*137*	*126*	*92*	*117*	*113*	*109*	*116*	*77*	*61*	*24*	*8*	*0*	*0*
152	Newark, Ohio.	0	149	192	171	170	138	165	165	174	142	108	42	43	20	9	1
		0	*111*	*161*	*156*	*143*	*143*	*191*	*167*	*153*	*129*	*88*	*72*	*53*	*21*	*15*	*2*
153	Norwood, Ohio.	4	71	78	77	80	81	92	55	62	63	51	32	13	5	3	3
		0	*69*	*71*	*89*	*87*	*65*	*62*	*81*	*83*	*64*	*64*	*42*	*23*	*20*	*8*	*1*
154	Portsmouth, Ohio.	6	168	152	170	176	152	164	178	180	149	93	58	22	12	0	1
		7	*154*	*181*	*164*	*145*	*215*	*156*	*160*	*187*	*108*	*69*	*47*	*22*	*7*	*5*	*1*
155	Sidney, Ohio.	15	57	42	49	36	37	43	47	54	36	55	32	22	11	5	1
		17	*42*	*47*	*50*	*52*	*70*	*47*	*36*	*49*	*50*	*36*	*31*	*25*	*13*	*1*	*0*

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156	Steubenville, Ohio	36	101	118	141	132	127	133	122	122	91	62	34	26	14	15	3
		34	*125*	*135*	*124*	*123*	*137*	*138*	*128*	*111*	*94*	*61*	*38*	*36*	*23*	*7*	*5*
157	Enid, Okla	0	85	70	84	82	104	103	87	83	80	58	37	23	10	3	0
		0	*71*	*93*	*68*	*87*	*98*	*101*	*95*	*96*	*87*	*83*	*67*	*33*	*8*	*4*	*2*
158	McAlester, Okla	0	61	57	51	57	58	56	63	55	52	31	23	5	6	2	0
		0	*61*	*48*	*51*	*52*	*58*	*60*	*53*	*52*	*55*	*37*	*34*	*18*	*6*	*1*	*0*
159	Beaver Falls, Pa	6	57	71	71	69	103	88	70	70	40	38	37	10	12	4	0
		6	*83*	*61*	*71*	*68*	*73*	*70*	*70*	*69*	*57*	*48*	*35*	*23*	*8*	*5*	*2*
160	Carbondale, Pa	5	121	133	151	131	153	142	132	130	99	56	17	9	2	0	0
		3	*128*	*136*	*147*	*124*	*161*	*154*	*142*	*127*	*103*	*69*	*33*	*19*	*3*	*2*	*0*
161	Carlisle, Pa	5	76	73	79	55	81	69	92	72	61	48	25	15	8	0	0
		7	*66*	*68*	*85*	*82*	*100*	*72*	*88*	*58*	*62*	*39*	*28*	*32*	*8*	*2*	*2*
162	Charleroi, Pa	0	83	82	100	105	100	84	62	68	39	24	13	8	0	0	0
		0	*94*	*84*	*87*	*89*	*96*	*89*	*83*	*76*	*47*	*33*	*11*	*9*	*3*	*0*	*0*
163	Clearfield, Pa	0	63	55	59	53	66	64	65	48	38	24	32	23	10	4	1
		0	*59*	*45*	*64*	*41*	*63*	*41*	*73*	*51*	*48*	*31*	*31*	*11*	*14*	*6*	*0*
164	Columbia, Pa	0	86	85	88	76	93	76	90	79	60	45	16	13	9	4	1
		0	*87*	*85*	*93*	*95*	*91*	*101*	*106*	*63*	*51*	*25*	*30*	*22*	*13*	*2*	*0*
165	Donora, Pa	0	56	63	70	59	57	54	61	38	43	10	3	0	0	0	0
		0	*75*	*55*	*81*	*79*	*64*	*56*	*47*	*21*	*20*	*8*	*5*	*0*	*0*	*0*	*0*
166	Franklin, Pa	0	57	55	49	48	60	67	55	69	55	43	36	20	8	1	0
		0	*50*	*45*	*65*	*64*	*57*	*65*	*79*	*67*	*64*	*51*	*44*	*18*	*13*	*0*	*0*
167	Homestead, Pa	4	86	82	89	95	112	99	98	94	64	44	23	23	9	1	0
		8	*121*	*101*	*107*	*68*	*91*	*79*	*86*	*71*	*59*	*49*	*29*	*15*	*9*	*3*	*0*
168	Lebanon, Pa	20	122	148	142	143	139	145	153	131	97	73	28	24	7	5	0
		26	*115*	*146*	*138*	*157*	*149*	*125*	*152*	*136*	*92*	*71*	*47*	*28*	*6*	*1*	*0*
169	Mahanoy City, Pa	0	79	157	144	110	121	121	124	110	77	45	10	7	4	2	0
		0	*91*	*110*	*150*	*139*	*122*	*155*	*129*	*132*	*93*	*59*	*19*	*7*	*4*	*2*	*0*
170	North Braddock, Pa.[1]	0	132	115	131	117	102	98	111	72	62	26	10	2	0	0	0
		0	*124*	*134*	*135*	*107*	*99*	*108*	*104*	*70*	*64*	*22*	*5*	*0*	*1*	*0*	*0*
171	Plymouth, Pa	0	152	143	135	113	122	130	108	76	37	16	20	13	8	2	0
		0	*146*	*140*	*132*	*119*	*142*	*108*	*78*	*55*	*44*	*17*	*22*	*14*	*5*	*0*	*0*
172	Pottstown, Pa	0	113	104	131	84	130	133	137	128	119	59	43	17	8	2	0
		0	*123*	*105*	*118*	*109*	*123*	*124*	*132*	*121*	*82*	*52*	*42*	*32*	*3*	*2*	*0*
173	Sharon, Pa	6	107	103	112	104	94	95	93	81	96	53	44	32	12	4	3
		4	*111*	*107*	*91*	*102*	*108*	*105*	*98*	*89*	*52*	*55*	*54*	*35*	*17*	*6*	*1*
174	Sunbury, Pa	10	84	108	113	103	110	117	108	90	80	74	39	31	17	1	2
		9	*76*	*113*	*107*	*103*	*93*	*123*	*106*	*101*	*78*	*56*	*45*	*38*	*13*	*3*	*0*
175	Warren, Pa	0	85	97	92	72	87	90	82	99	93	49	62	31	15	7	6
		0	*80*	*76*	*97*	*91*	*76*	*101*	*81*	*102*	*77*	*53*	*52*	*29*	*31*	*3*	*3*
176	Central Falls, R. I.	52	71	91	64	63	61	73	74	92	52	25	28	15	3	1	0
		64	*74*	*75*	*72*	*50*	*54*	*63*	*75*	*94*	*56*	*27*	*17*	*10*	*7*	*2*	*0*
177	Spartanburg, S. C.[1]	0	81	92	164	118	138	117	93	103	60	27	4	6	0	0	0
		0	*123*	*125*	*143*	*148*	*173*	*130*	*130*	*114*	*71*	*45*	*19*	*8*	*1*	*1*	*0*
178	Beaumont, Tex	0	19	174	159	123	167	142	149	80	65	62	52	17	5	2	2
		0	*17*	*149*	*161*	*166*	*154*	*159*	*153*	*126*	*117*	*100*	*89*	*26*	*10*	*2*	*2*
179	Ogden, Utah	178	155	105	193	202	234	225	229	224	182	120	98	33	23	20	9
		8	*132*	*209*	*223*	*221*	*186*	*230*	*236*	*221*	*188*	*174*	*87*	*44*	*46*	*8*	*3*
180	Everett, Wash	12	131	136	146	181	166	147	170	145	131	95	59	31	19	9	0
		9	*154*	*146*	*163*	*179*	*162*	*157*	*194*	*139*	*134*	*99*	*70*	*58*	*22*	*4*	*2*

[1] Elementary schools only reported.

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TABLE 4.—*Distribution, by age, of pupils in public schools (elementary and secondary) in certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	5 years or under.	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	17 years.	18 years.	19 years.	20 years or over.
181	Clarksburg, W. Va.	0	118	77	93	86	84	81	96	74	82	55	29	23	7	4	4
		0	*100*	*83*	*87*	*90*	*85*	*76*	*73*	*81*	*61*	*48*	*30*	*30*	*8*	*3*	*1*
182	Appleton, Wis.	2	85	90	97	73	90	81	72	86	94	78	37	22	8	11	3
		2	*96*	*100*	*91*	*89*	*95*	*89*	*84*	*72*	*65*	*77*	*29*	*32*	*20*	*3*	*1*
183	Beloit, Wis.	7	106	102	124	98	102	127	123	115	105	91	45	3	19	5	1
		9	*91*	*124*	*118*	*113*	*117*	*104*	*111*	*126*	*111*	*93*	*69*	*45*	*32*	*8*	*3*
184	Fond du Lac, Wis.	1	66	93	106	99	110	94	119	124	113	110	53	34	22	9	4
		2	*101*	*112*	*116*	*104*	*98*	*119*	*126*	*123*	*152*	*117*	*62*	*51*	*22*	*8*	*2*
185	Marinette, Wis.	7	117	111	114	104	95	96	109	115	106	82	62	33	22	13	6
		2	*104*	*90*	*128*	*120*	*127*	*125*	*128*	*136*	*98*	*70*	*52*	*46*	*24*	*13*	*4*
186	Wausau, Wis.	24	124	145	106	131	121	125	106	107	111	113	58	19	16	7	2
		17	*111*	*138*	*134*	*109*	*127*	*115*	*144*	*105*	*102*	*96*	*56*	*38*	*16*	*1*	*2*

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TABLE 5.—*The number of pupils of normal age,*[1] *more than the normal age and less than the normal age of pupils in their respective grades in certain cities of 25,000 population and over.*

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total, all ages.	Largest age group.	Age of largest group.	Of normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years or more.	Total.
1	Birmingham, Ala	3,013	407	9	1,018	819	536	321	190	121	1,987	8	0	8
		3,209	*444*	*10*	*1,118*	*909*	*564*	*308*	*203*	*103*	*2,087*	*4*	*0*	*4*
2	Mobile, Ala	1,521	212	10	683	335	201	127	64	61	788	50	0	50
		1,589	*218*	*13*	*794*	*305*	*162*	*114*	*76*	*57*	*714*	*61*	*20*	*81*
3	Montgomery, Ala	1,574	231	8	701	340	241	146	79	55	861	12	.....	12
		1,733	*242*	*11*	*794*	*390*	*214*	*180*	*82*	*63*	*929*	*10*	.....	*10*
4	Little Rock, Ark	2,644	296	14	1,193	552	324	180	94	202	1,352	96	3	99
		2,877	*312*	*9*	*1,329*	*613*	*302*	*157*	*65*	*285*	*1,422*	*117*	*9*	*126*
5	Los Angeles, Cal	14,183	1,682	12	8,003	3,219	1,680	637	214	156	5,906	261	13	274
		13,468	*1,533*	*10*	*8,460*	*2,818*	*1,257*	*417*	*122*	*70*	*4,684*	*315*	*9*	*324*
6	Pueblo (Dist. No. 20), Colo	1,328	162	8	751	306	151	67	22	2	548	28	1	29
		1,290	*158*	*8*	*784*	*278*	*124*	*46*	*15*	*2*	*465*	*41*	.....	*41*
7	Pueblo, Colo	996	126	7	580	216	111	46	14	3	390	24	2	26
		992	*128*	*12*	*604*	*216*	*87*	*44*	*15*	*6*	*368*	*18*	*2*	*20*
8	Bridgeport, Conn	5,718	644	10	2,536	1,249	818	421	154	81	2,723	452	7	459
		5,715	*643*	*10*	*2,515*	*1,247*	*827*	*415*	*154*	*85*	*2,728*	*468*	*4*	*472*
9	New Haven, Conn	8,753	1,025	8	4,995	1,319	656	275	92	74	2,416	1,296	46	1,342
		8,562	*1,010*	*12*	*4,927*	*1,322*	*616*	*255*	*86*	*41*	*2,320*	*1,269*	*48*	*1,317*
10	Meriden, Conn	1,662	208	7	1,086	206	71	17	8	4	306	259	11	270
		1,581	*187*	*13*	*1,020*	*171*	*47*	*25*	*5*	*4*	*252*	*293*	*16*	*309*
11	Waterbury, Conn	4,248	484	12	2,343	638	326	158	63	41	1,226	641	38	679
		4,154	*458*	*8*	*2,304*	*637*	*273*	*117*	*50*	*29*	*1,106*	*700*	*44*	*744*
12	(a) Savannah, Ga	2,074	127	9	1,047	483	293	122	63	39	1,000	26	1	27
		2,161	*169*	*11*	*1,094*	*530*	*329*	*130*	*48*	*13*	*1,040*	*26*	*1*	*27*
	(b) Savannah, Ga. (colored)	893	269	8	229	217	183	132	76	50	658	6	0	6
		1,321	*279*	*11*	*341*	*324*	*275*	*187*	*116*	*67*	*969*	*11*	*0*	*11*
13	Aurora, Ill	1,048	136	6	773	127	52	23	3	8	213	59	3	62
		887	*132*	*6*	*675*	*103*	*17*	*18*	*5*	*3*	*146*	*65*	*1*	*66*
14	Aurora (West Side), Ill	472	70	13	324	81	44	7	4	1	137	11	0	11
		527	*79*	*7*	*374*	*77*	*23*	*9*	*5*	*0*	*114*	*39*	*0*	*39*
15	Chicago, Ill	108,442	12,652	13	66,800	21,521	10,451	4,130	1,489	910	38,501	3,028	113	3,141
		102,746	*12,246*	*8*	*68,528*	*18,624*	*7,789*	*2,757*	*917*	*505*	*30,592*	*3,520*	*106*	*3,626*
16	Danville, Ill	1,840	229	9	982	451	224	106	45	20	845	13	.....	13
		1,851	*229*	*10*	*1,116*	*399*	*190*	*80*	*33*	*8*	*710*	*25*	.....	*25*
17	Decatur, Ill	1,806	241	12	994	427	223	97	27	9	783	29	.....	29
		1,887	*254*	*13*	*1,139*	*401*	*215*	*83*	*28*	*5*	*732*	*16*	.....	*16*

[1] For definition of normal age, see footnote page 12.

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TABLE 5.—*The number of pupils of normal age, more than the normal age and less than the normal age of pupils in their respective grades in certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total, all ages.	Largest age group.	Age of largest group.	Of normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years or more.	Total.
18	Joliet, Ill.	2,321	284	8	1,515	445	189	64	25	8	731	74	1	74
		2,227	*272*	*6*	*1,572*	*380*	*142*	*37*	*6*	.....	*565*	*89*	*1*	*89*
19	Quincy, Ill.	1,718	207	10	876	373	224	96	45	14	752	90	.....	90
		1,598	*185*	*12*	*942*	*310*	*161*	*68*	*9*	*14*	*562*	*84*	.....	*84*
20	Rockford, Ill.	2,750	346	10	1,675	611	244	94	29	18	996	74	5	79
		2,711	*337*	*11*	*1,771*	*522*	*262*	*56*	*18*	*2*	*860*	*79*	*1*	*80*
21	Springfield, Ill.	2,755	350	8	1,746	517	262	120	41	12	952	56	1	57
		2,614	*350*	*13*	*1,760*	*503*	*210*	*65*	*14*	*10*	*802*	*51*	*1*	*52*
22	Anderson, Ind.	1,469	196	8	733	406	196	85	32	12	731	5	.....	5
		1,418	*188*	*8*	*799*	*351*	*157*	*75*	*15*	*9*	*607*	*12*	.....	*12*
23	Fort Wayne, Ind.	2,327	294	11	1,572	430	155	50	15	2	652	96	7	103
		2,444	*316*	*6*	*1,801*	*354*	*145*	*28*	*4*	*2*	*533*	*109*	*1*	*110*
24	Indianapolis, Ind.	11,638	1,458	8	7,357	2,316	1,104	375	136	46	3,977	299	5	304
		11,185	*1,325*	*11*	*7,690*	*1,851*	*891*	*293*	*94*	*15*	*3,144*	*340*	*9*	*349*
25	Marion, Ind.	1,441	176	11	1,009	266	92	31	9	6	404	28	.....	28
		1,408	*175*	*12*	*1,048*	*222*	*66*	*30*	*4*	.....	*322*	*38*	.....	*38*
26	Muncie, Ind.	1,468	189	7	863	314	179	73	26	8	600	5	.....	5
		1,583	*196*	*8*	*1,015*	*347*	*135*	*57*	*11*	*5*	*555*	*13*	.....	*13*
27	Terre Haute, Ind.	3,633	479	8	2,095	795	426	175	61	23	1,480	57	1	58
		3,539	*444*	*7*	*2,280*	*718*	*501*	*151*	*34*	*11*	*1,195*	*63*	*1*	*64*
28	Burlington, Iowa.	1,492	182	10	831	329	163	67	20	8	587	74	.....	74
		1,602	*203*	*10*	*1,008*	*328*	*133*	*35*	*9*	*3*	*506*	*87*	*1*	*88*
29	Council Bluffs, Iowa.	2,169	276	8	1,184	424	262	114	51	31	882	99	4	103
		2,157	*262*	*11*	*1,268*	*457*	*237*	*97*	*30*	*14*	*835*	*55*	*1*	*56*
30	Des Moines, Iowa.	5,015	614	8	2,776	1,149	626	252	78	21	2,126	110	3	113
		4,904	*603*	*8*	*3,066*	*1,037*	*460*	*152*	*59*	*20*	*1,728*	*108*	*2*	*110*
31	Dubuque, Iowa.	1,270	165	9	783	250	137	64	12	7	470	17	.....	17
		1,218	*174*	*13*	*830*	*241*	*96*	*18*	*4*	*4*	*363*	*25*	.....	*25*
32	Kansas City, Kans.	4,128	478	10	1,912	1,062	655	307	124	44	2,192	24	.....	24
		4,335	*469*	*9*	*2,166*	*1,164*	*556*	*268*	*92*	*43*	*2,123*	*45*	*1*	*46*
33	Topeka, Kans.	2,538	309	10	1,487	547	271	137	44	17	1,016	33	2	35
		2,496	*303*	*10*	*1,625*	*512*	*202*	*76*	*20*	*13*	*823*	*47*	*1*	*48*
34	Wichita, Kans.	2,559	299	12	1,314	593	341	172	75	27	1,208	36	1	37
		2,765	*342*	*13*	*1,668*	*597*	*287*	*130*	*39*	*17*	*1,070*	*27*	.....	*27*
35	Covington, Ky.	1,594	213	8	891	338	183	98	33	16	668	34	1	35
		1,591	*198*	*10*	*999*	*292*	*178*	*70*	*16*	*6*	*562*	*30*	.....	*30*

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36	Louisville, Ky	10,882	1,280	10	5,932	2,243	1,286	661	290	205	4,685	263	2	265
		10,835	*1,389*	*13*	*6,643*	*1,948*	*1,010*	*506*	*225*	*185*	*3,813*	*371*	*8*	*378*
37	Lewiston, Me	819	109	14	451	131	72	46	28	15	292	68	8	76
		766	*95*	*12*	*418*	*130*	*68*	*27*	*21*	*17*	*263*	*76*	*9*	*85*
38	Brockton, Mass	3,771	416	13	2,103	322	116	43	10	2	493	1,129	46	1,175
		3,593	*408*	*10*	*1,985*	*215*	*68*	*22*	*7*	*3*	*313*	*1,255*	*40*	*1,290*
39	Everett, Mass	2,777	305	13	1,549	236	90	20	12	1	359	836	33	869
		2,881	*325*	*10*	*1,538*	*219*	*74*	*15*	*5*	.....	*313*	*963*	*67*	*1,030*
40	Fall River, Mass	6,673	848	13	3,189	862	515	325	178	139	2,019	1,404	61	1,465
		6,208	*782*	*12*	*3,006*	*706*	*422*	*259*	*151*	*127*	*1,665*	*1,473*	*62*	*1,535*
41	Fitchburg, Mass	1,630	200	8	1,101	217	63	22	15	10	327	195	7	202
		1,633	*215*	*13*	*1,167*	*181*	*40*	*22*	*15*	*1*	*259*	*197*	*10*	*207*
42	Haverhill, Mass	2,388	278	12	1,241	186	80	22	4	4	296	804	47	851
		2,296	*253*	*8*	*1,133*	*164*	*59*	*23*	*7*	*8*	*261*	*868*	*34*	*902*
43	Holyoke, Mass	2,473	324	13	1,274	258	109	54	24	16	461	689	49	738
		2,387	*307*	*9*	*1,174*	*221*	*108*	*59*	*20*	*7*	*415*	*722*	*76*	*798*
44	Lowell, Mass	4,855	601	13	2,626	600	316	140	54	41	1,151	984	94	1,078
		4,605	*566*	*13*	*2,534*	*514*	*232*	*98*	*50*	*23*	*917*	*1,051*	*107*	*1,058*
45	Malden, Mass	2,999	348	13	1,803	385	155	51	8	11	610	569	17	586
		2,983	*342*	*10*	*1,860*	*538*	*123*	*32*	*10*	*4*	*707*	*598*	*18*	*616*
46	New Bedford, Mass	4,777	713	7	2,714	707	378	215	81	85	1,466	581	16	597
		4,775	*614*	*8*	*2,534*	*543*	*295*	*143*	*71*	*32*	*1,084*	*1,097*	*60*	*1,157*
47	Newton, Mass	2,391	274	13	1,440	237	76	25	12	1	351	562	38	600
		2,374	*275*	*7*	*1,404*	*216*	*65*	*26*	*6*	*4*	*317*	*614*	*39*	*653*
48	Pittsfield, Mass	1,979	241	10	1,164	240	109	44	10	5	408	391	16	407
		1,909	*214*	*7*	*1,119*	*202*	*68*	*25*	*7*	*2*	*304*	*469*	*17*	*486*
49	Quincy, Mass	2,796	365	6	1,551	264	127	39	13	4	447	676	122	798
		2,649	*347*	*11*	*1,488*	*248*	*110*	*29*	*6*	.....	*393*	*665*	*103*	*768*
50	Somerville, Mass	5,231	574	8	2,760	419	164	42	9	4	638	1,756	77	1,833
		4,972	*549*	*10*	*2,549*	*363*	*95*	*20*	*11*	*5*	*494*	*1,840*	*89*	*1,929*
51	Taunton, Mass	1,979	226	10	1,080	240	132	59	26	24	481	406	12	418
		1,944	*220*	*12*	*1,006*	*230*	*103*	*41*	*20*	*14*	*408*	*505*	*25*	*530*
52	Waltham, Mass	1,151	141	7	682	99	26	12	5	1	143	311	15	326
		1,177	*157*	*10*	*622*	*78*	*29*	*10*	*1*	.....	*118*	*415*	*22*	*437*
53	Worcester, Mass	8,094	986	12	4,917	986	421	139	49	14	1,609	1,434	134	1,568
		7,521	*912*	*8*	*4,586*	*759*	*312*	*115*	*42*	*9*	*1,237*	*1,560*	*138*	*1,698*
54	Battle Creek, Mich	1,304	165	10	502	355	265	109	50	20	799	3	.....	3
		1,353	*187*	*13*	*600*	*368*	*233*	*95*	*39*	*12*	*747*	*6*	.....	*6*
55	Bay City, Mich	2,498	326	7	1,254	513	286	157	59	46	1,061	175	8	183
		2,290	*277*	*8*	*1,255*	*531*	*246*	*100*	*35*	*14*	*924*	*109*	*2*	*111*
56	Calumet, Mich	2,292	310	8	1,380	433	220	119	36	16	824	86	2	88
		2,158	*292*	*7*	*1,423*	*377*	*179*	*45*	*17*	*6*	*624*	*108*	*3*	*111*
57	Detroit, Mich	18,386	2,267	8	11,028	3,862	1,957	742	250	104	6,915	432	11	443
		17,392	*2,110*	*8*	*11,218*	*3,438*	*1,567*	*552*	*135*	*60*	*5,742*	*421*	*11*	*432*
58	Grand Rapids, Mich	5,213	598	12	2,094	1,577	959	386	152	57	3,131	37	1	38
		5,062	*612*	*13*	*2,221*	*1,556*	*821*	*291*	*99*	*34*	*2,801*	*39*	*1*	*40*
59	Kalamazoo, Mich	2,075	237	8	1,361	378	183	72	23	8	664	47	3	50
		2,066	*240*	*12*	*1,468*	*359*	*116*	*40*	*9*	*3*	*527*	*68*	*3*	*71*
60	Saginaw, Mich	1,634	192	14	1,065	251	148	56	15	2	472	97	.....	97
		1,619	*199*	*6*	*1,145*	*209*	*99*	*29*	*6*	*4*	*347*	*126*	*1*	*127*
61	Saginaw (west side), Mich	1,183	144	9	757	196	97	38	5	3	339	87	.....	87
		1,105	*139*	*12*	*749*	*156*	*51*	*26*	*7*	.....	*240*	*115*	*1*	*116*

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TABLE 5.—*The number of pupils of normal age, more than the normal age, and less than the normal age of pupils in their respective grades in certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total, all ages.	Largest age group.	Age of largest group.	Of normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years or more.	Total.
62	Duluth, Minn	4,851	570	8	2,859	1,074	511	178	64	37	1,864	127	1	128
		4,666	*578*	*8*	*2,999*	*963*	*360*	*119*	*42*	*23*	*1,507*	*157*	*3*	*160*
63	Minneapolis, Minn	16,927	1,852	12	9,301	4,112	2,117	813	286	116	7,444	166	6	172
		16,811	*1,900*	*12*	*10,219*	*3,850*	*1,709*	*568*	*182*	*68*	*6,377*	*211*	*4*	*215*
64	St. Joseph, Mo	4,202	519	8	2,465	810	461	214	77	49	1,611	121	5	126
		4,200	*507*	*11*	*2,664*	*797*	*384*	*148*	*54*	*14*	*1,397*	*135*	*4*	*139*
65	St. Louis, Mo	29,521	3,893	12	12,083	9,183	4,874	2,074	737	391	17,258	168	11	179
		29,502	*3,914*	*8*	*13,410*	*9,210*	*4,281*	*1,672*	*537*	*245*	*15,945*	*140*	*7*	*147*
66	Butte, Mont	2,532	303	8	1,516	527	252	127	37	15	958	57	1	58
		2,563	*315*	*6*	*1,706*	*458*	*194*	*65*	*19*	*10*	*746*	*109*	*2*	*111*
67	East Orange, N. J	1,873	222	8	1,017	385	221	111	35	6	758	98	.....	98
		1,851	*219*	*11*	*1,054*	*383*	*211*	*68*	*15*	*15*	*692*	*81*	*4*	*85*
68	Hoboken, N. J	3,726	498	10	2,001	861	474	170	70	21	1,596	127	2	129
		3,589	*485*	*10*	*2,062*	*767*	*374*	*143*	*58*	*19*	*1,361*	*162*	*4*	*166*
69	New Brunswick, N. J	964	150	10	489	184	84	47	12	10	337	131	7	138
		940	*130*	*9*	*512*	*154*	*71*	*26*	*13*	*3*	*247*	*172*	*9*	*181*
70	Orange, N. J	1,507	235	6	757	339	204	116	47	16	722	27	1	28
		1,388	*200*	*8*	*653*	*378*	*172*	*87*	*38*	*16*	*691*	*44*	.....	*44*
71	Paterson, N. J	7,079	878	10	4,136	1,305	626	260	87	26	2,304	610	29	639
		6,812	*904*	*10*	*4,257*	*1,133*	*470*	*164*	*59*	*13*	*1,859*	*673*	*43*	*716*
72	Passaic, N. J	2,461	332	8	1,297	548	307	167	64	20	1,106	56	2	58
		2,315	*307*	*7*	*1,306*	*479*	*257*	*125*	*54*	*26*	*941*	*57*	*11*	*68*
73	Perth Amboy, N. J	1,991	241	8	981	426	234	100	39	14	822	176	12	188
		1,933	*255*	*8*	*1,062*	*396*	*185*	*53*	*18*	*6*	*658*	*206*	*7*	*213*
74	Trenton, N. J	4,436	541	10	2,266	931	523	214	105	37	1,810	340	20	360
		4,495	*577*	*8*	*2,595*	*856*	*383*	*151*	*56*	*18*	*1,444*	*439*	*19*	*458*
75	Albany, N. Y	4,366	498	13	2,479	771	437	165	45	27	1,445	424	18	442
		4,049	*514*	*12*	*2,430*	*695*	*299*	*111*	*25*	*7*	*1,137*	*461*	*21*	*482*
76	Auburn, N. Y	1,501	182	7	890	265	134	47	16	7	469	140	2	142
		1,436	*170*	*11*	*886*	*211*	*121*	*39*	*13*	*6*	*390*	*159*	*1*	*160*
77	Elmira, N. Y	1,822	204	12	990	359	209	90	31	18	707	121	4	125
		1,708	*222*	*12*	*968*	*333*	*154*	*67*	*29*	*7*	*590*	*149*	*1*	*150*
78	Jamestown, N. Y	1,919	235	11	1,234	340	145	60	6	6	557	123	5	128
		1,804	*217*	*12*	*1,235*	*284*	*95*	*41*	*6*	*6*	*432*	*133*	*4*	*137*
79	Kingston, N. Y	1,591	202	10	785	341	196	94	51	18	700	101	5	106
		1,551	*194*	*12*	*811*	*308*	*169*	*74*	*30*	*16*	*597*	*142*	*1*	*143*

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80	Newburgh, N. Y	1,441	188	13	768	256	157	69	18	10	510	161	2	163
		1,437	*202*	*10*	*787*	*246*	*112*	*63*	*19*	*10*	*450*	*182*	*18*	*200*
81	Niagara Falls, N. Y	1,513	189	13	860	290	150	S :	24	12	558	91	4	95
		1,404	*178*	*13*	*892*	*245*	*109*	*49*	*8*	*10*	*421*	*89*	*2*	*91*
82	Poughkeepsie, N. Y	1,213	166	12	689	195	106	54	25	10	390	132	2	134
		1,195	*171*	*12*	*715*	*210*	*89*	*30*	*11*	*2*	*342*	*131*	*7*	*138*
83	Rochester, N. Y	8,306	1,021	12	4,603	1,452	684	223	91	54	2,504	1,136	63	1,199
		8,092	*1,024*	*11*	*5,617*	*1,233*	*436*	*157*	*77*	*26*	*1,929*	*526*	*20*	*546*
84	Schenectady, N. Y	4,365	546	7	2,260	931	573	290	127	71	1,992	109	4	113
		4,110	*488*	*7*	*2,236*	*841*	*543*	*260*	*84*	*34*	*1,762*	*111*	*1*	*112*
85	Syracuse, N. Y	6,793	825	12	3,975	1,259	641	235	85	37	2,257	554	7	561
		6,678	*805*	*10*	*4,063*	*1,131*	*588*	*180*	*45*	*21*	*1,965*	*625*	*5*	*630*
86	Troy, N. Y	2,429	299	12	1,173	500	278	183	71	25	1,057	192	7	199
		2,241	*263*	*10*	*1,190*	*488*	*247*	*96*	*33*	*8*	*872*	*175*	*4*	*179*
87	Utica, N. Y	3,616	460	12	2,157	688	393	147	66	52	1,346	110	3	113
		3,300	*407*	*8*	*2,120*	*605*	*262*	*79*	*47*	*36*	*1,029*	*145*	*6*	*151*
88	Watertown, N. Y	1,902	223	10	918	416	271	127	50	24	888	94	2	96
		1,792	*224*	*12*	*919*	*401*	*244*	*95*	*37*	*13*	*790*	*83*	.....	*83*
89	Yonkers, N. Y	5,023	624	9	2,356	1,070	682	286	135	73	2,246	414	7	421
		4,869	*574*	*7*	*2,598*	*988*	*501*	*236*	*109*	*46*	*1,880*	*381*	*10*	*391*
90	Akron, Ohio	3,716	429	13	2,316	442	208	73	23	10	756	614	30	644
		3,612	*446*	*7*	*2,324*	*420*	*127*	*36*	*12*	*7*	*602*	*660*	*26*	*686*
91	Canton, Ohio	2,686	313	7	1,569	510	298	153	52	13	1,026	91	.....	91
		2,628	*335*	*9*	*1,709*	*516*	*209*	*79*	*14*	*9*	*827*	*91*	*1*	*92*
92	Columbus, Ohio	9,521	1,084	9	5,587	1,952	1,025	468	184	80	3,709	208	17	225
		9,621	*1,118*	*10*	*6,133*	*1,794*	*903*	*351*	*146*	*51*	*3,245*	*236*	*7*	*243*
93	Dayton, Ohio	5,089	625	8	3,185	1,009	507	205	77	24	1,822	82	.....	82
		4,940	*630*	*9*	*3,370*	*923*	*384*	*132*	*43*	*12*	*1,494*	*75*	*1*	*76*
94	Hamilton, Ohio	1,976	264	8	1,136	401	242	120	41	14	818	22	.....	22
		1,799	*237*	*11*	*1,140*	*365*	*175*	*66*	*23*	*11*	*640*	*19*	.....	*19*
95	Springfield, Ohio	2,666	309	8	1,679	456	251	109	33	16	865	121	1	122
		2,419	*285*	*7*	*1,648*	*388*	*184*	*62*	*16*	*3*	*653*	*115*	*3*	*118*
96	Toledo, Ohio	8,621	1,010	13	5,200	1,614	902	363	182	46	3,107	307	7	314
		8,039	*1,002*	*8*	*5,391*	*1,350*	*679*	*207*	*63*	*18*	*2,317*	*320*	*11*	*331*
97	Youngstown, Ohio	3,703	420	10	1,907	878	512	237	91	35	1,753	43	.....	43
		3,603	*444*	*8*	*2,091*	*820*	*439*	*146*	*57*	*17*	*1,479*	*33*	.....	*33*
98	Allentown, Pa	3,168	429	6	2,252	445	176	54	26	9	710	196	10	206
		3,044	*405*	*6*	*2,193*	*425*	*138*	*40*	*10*	*3*	*616*	*228*	*7*	*235*
99	Altoona, Pa	3,052	344	13	1,694	637	379	156	54	23	1,249	105	4	109
		3,089	*372*	*9*	*1,872*	*628*	*314*	*101*	*34*	*10*	*1,087*	*125*	*5*	*130*
100	Easton, Pa	1,783	233	8	1,050	350	206	82	24	14	676	56	1	57
		1,746	*239*	*8*	*1,088*	*351*	*179*	*56*	*20*	*7*	*613*	*44*	*1*	*45*
101	Erie, Pa	2,946	358	10	1,147	685	518	352	177	55	1,787	12	.....	12
		2,857	*364*	*8*	*1,316*	*711*	*454*	*223*	*85*	*22*	*1,495*	*26*	.....	*26*
102	Harrisburg, Pa	3,709	484	11	2,269	703	325	141	52	33	1,254	166	20	186
		3,654	*437*	*10*	*2,384*	*633*	*260*	*90*	*32*	*21*	*1,036*	*224*	*10*	*234*
103	Lancaster, Pa	2,410	345	10	1,617	375	144	68	23	10	620	164	9	173
		2,247	*303*	*8*	*1,623*	*323*	*106*	*34*	*10*	*6*	*479*	*136*	*9*	*145*
104	New Castle, Pa	2,195	269	9	1,335	422	274	100	19	10	825	35	.....	35
		2,232	*307*	*8*	*1,531*	*368*	*200*	*53*	*11*	*2*	*634*	*67*	.....	*67*
105	Norristown, Pa	1,306	155	10	848	226	102	57	22	18	425	33	.....	33
		1,251	*177*	*12*	*900*	*169*	*88*	*42*	*12*	*8*	*319*	*32*	.....	*32*

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TABLE 5.—*The number of pupils of normal age, more than the normal age, and less than the normal age of pupils in their respective grades in certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total, all ages.	Largest age group.	Age of largest group.	Of normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years. or more.	Total.
106	Philadelphia, Pa.	65,180	7,860	8	34,933	14,366	8,188	4,066	1,554	640	28,814	1,413	20	1,433
		65,490	*8,134*	*8*	*37,498*	*13,842*	*7,672*	*3,277*	*1,231*	*491*	*26,513*	*1,465*	*14*	*1,479*
107	Pittsburg, Pa.	20,583	2,330	8	10,137	4,575	2,846	1,435	600	304	9,763	649	34	683
		19,979	*2,297*	*10*	*10,502*	*4,501*	*2,508*	*1,024*	*407*	*161*	*8,599*	*742*	*36*	*778*
108	Reading, Pa.	4,633	609	8	2,785	890	493	178	42	17	1,620	218	10	228
		4,544	*614*	*8*	*3,093*	*723*	*309*	*100*	*20*	*2*	*1,154*	*278*	*19*	*297*
109	Wilkes-Barre, Pa.	3,802	562	6	2,720	638	195	71	24	9	937	141	4	145
		3,613	*488*	*6*	*2,684*	*517*	*169*	*44*	*14*	*20*	*764*	*163*	*2*	*165*
110	Williamsport, Pa.	2,322	287	11	1,429	423	197	98	31	15	764	115	14	129
		2,397	*272*	*12*	*1,536*	*447*	*175*	*59*	*20*	*6*	*707*	*149*	*5*	*154*
111	York, Pa.	2,702	335	7	1,823	463	185	87	20	5	760	116	3	119
		2,508	*331*	*8*	*1,845*	*385*	*158*	*54*	*15*	*3*	*615*	*137*	*1*	*138*
112	Newport, R. I.	1,548	183	8	904	213	84	37	12	4	350	275	19	294
		1,475	*176*	*13*	*860*	*177*	*81*	*33*	*10*	*7*	*308*	*290*	*17*	*307*
113	Providence, R. I.	11,424	1,349	12	7,206	2,045	1,028	483	173	112	3,841	360	17	377
		11,272	*1,360*	*8*	*7,268*	*1,952*	*952*	*394*	*141*	*104*	*3,543*	*446*	*15*	*461*
114	Warwick, R. I.	1,480	172	12	779	218	131	66	41	22	478	215	8	223
		1,437	*183*	*12*	*808*	*205*	*87*	*51*	*23*	*11*	*377*	*235*	*17*	*252*
115	Woonsocket, R. I.	1,639	214	13	717	233	168	117	64	42	624	288	10	298
		1,542	*190*	*12*	*741*	*208*	*139*	*105*	*54*	*21*	*527*	*269*	*5*	*274*
116	Columbia, S. C.	676	97	11	208	214	125	79	28	22	468	.....	.....	.....
		773	*97*	*9*	*256*	*262*	*138*	*76*	*28*	*13*	*517*	.....	.....	.....
117	Nashville, Tenn.	6,375	851	8	2,506	1,636	985	648	318	245	3,832	35	2	37
		6,983	*920*	*10*	*2,963*	*1,785*	*1,029*	*624*	*290*	*247*	*3,975*	*45*	.....	*45*
118	Dallas, Tex.	3,768	523	8	1,506	1,097	664	293	121	59	2,234	27	1	28
		4,371	*574*	*8*	*1,871*	*1,288*	*754*	*291*	*109*	*33*	*2,475*	*25*	.....	*25*
119	Galveston, Tex.	1,563	224	7	600	475	279	173	23	7	958	5	.....	5
		1,716	*242*	*7*	*726*	*470*	*280*	*157*	*51*	*25*	*983*	*7*	.....	*7*
120	Houston, Tex.	3,654	514	9	940	1,018	798	482	264	141	2,703	11	.....	11
		3,431	*479*	*9*	*1,043*	*942*	*662*	*421*	*242*	*110*	*2,377*	*11*	.....	*11*
121	San Antonio, Tex.	4,302	581	8	1,317	1,157	854	467	285	209	2,972	12	1	13
		4,389	*582*	*8*	*1,509*	*1,254*	*787*	*432*	*213*	*175*	*2,861*	*18*	*1*	*19*
122	Salt Lake City, Utah	6,564	763	12	2,919	1,391	1,020	704	305	135	3,555	89	1	90
		6,566	*756*	*8*	*3,784*	*1,504*	*803*	*279*	*68*	*17*	*2,669*	*112*	*1*	*113*
123	Lynchburg, Va.	1,564	214	8	514	413	277	198	89	68	1,045	5	.....	5
		1,448	*197*	*10*	*448*	*397*	*280*	*179*	*87*	*55*	*998*	*2*	.....	*2*

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124	Seattle, Wash.	10,766	1,200	12	5,298	2,767	1,554	636	221	151	5,329	137	2	139
		10,289	*1,229*	*12*	*5,503*	*2,735*	*1,291*	*461*	*118*	*45*	*4,648*	*133*	*5*	*138*
125	Spokane, Wash.	5,433	604	8	2,936	1,230	693	349	90	54	2,416	78	3	81
		5,276	*612*	*12*	*3,035*	*1,215*	*590*	*246*	*65*	*24*	*2,140*	*99*	*2*	*101*
126	Tacoma, Wash.	4,560	565	12	2,843	962	431	174	35	15	1,617	97	3	100
		4,140	*501*	*8*	*2,781*	*851*	*299*	*90*	*31*	*4*	*1,275*	*81*	*3*	*84*
127	Green Bay, Wis.	1,454	174	7	835	214	98	46	14	8	380	202	37	239
		1,469	*204*	*7*	*917*	*165*	*61*	*21*	*12*	*5*	*262*	*256*	*34*	*290*
128	La Crosse, Wis.	1,854	204	12	909	400	251	131	41	10	833	100	12	112
		1,765	*198*	*9*	*978*	*394*	*195*	*57*	*6*	.....	*652*	*122*	*11*	*133*
129	Madison, Wis.	1,289	156	9	772	225	132	46	15	9	427	83	7	90
		1,287	*169*	*10*	*833*	*209*	*92*	*26*	*6*	*3*	*356*	*115*	*3*	*118*
130	Racine, Wis.	2,215	280	11	1,545	307	135	46	22	8	518	141	11	152
		2,011	*262*	*12*	*1,507*	*226*	*78*	*28*	*11*	*4*	*347*	*148*	*9*	*157*
131	Sheboygan, Wis.	1,312	162	10	925	207	81	30	8	3	329	57	1	58
		1,185	*162*	*7*	*914*	*148*	*50*	*16*	*3*	*1*	*212*	*59*	.....	*59*
132	Superior, Wis.	2,091	273	7	1,314	404	195	52	20	7	678	94	5	99
		1,936	*269*	*9*	*1,338*	*325*	*113*	*40*	*13*	*5*	*496*	*95*	*7*	*102*

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TABLE 6.—*The number of pupils of normal age,[1] more than normal age, and less than the normal age of pupils in their respective grades in certain cities of less than 25,000 population.*

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total of all ages.	Largest age group.	Age of largest group.	Of normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years or more.	Total.
1	Fort Smith, Ark	1,400	158	9	792	252	172	79	48	28	579	27	2	29
		1,375	*157*	*8*	*812*	*238*	*152*	*81*	*28*	*23*	*522*	*40*	*1*	*41*
2	Hot Springs, Ark	1,103	145	7	488	220	161	118	65	43	607	8	.....	8
		1,278	*157*	*8*	*523*	*319*	*223*	*122*	*55*	*28*	*740*	*15*	.....	*15*
3	Alameda, Cal	1,440	180	12	741	368	199	65	29	16	677	22	.....	22
		1,442	*179*	*13*	*807*	*355*	*174*	*49*	*20*	*7*	*605*	*30*	.....	*30*
4	Fresno, Cal	1,727	207	8	791	411	249	134	53	74	921	15	.....	15
		1,653	*229*	*8*	*893*	*368*	*200*	*92*	*40*	*35*	*735*	*25*	.....	*25*
5	Pasadena, Cal	1,825	220	10	979	405	241	110	37	6	799	47	.....	47
		1,790	*214*	*10*	*1,109*	*365*	*177*	*65*	*14*	*4*	*625*	*50*	*8*	*58*
6	Riverside, Cal	954	121	10	574	178	113	38	11	13	353	27	.....	27
		922	*108*	*11*	*556*	*148*	*63*	*31*	*9*	*4*	*255*	*41*	.....	*41*
7	Santa Barbara, Cal	543	83	12	255	154	73	34	10	6	277	10	1	11
		532	*77*	*11*	*302*	*129*	*52*	*24*	*10*	*5*	*220*	*9*	*1*	*10*
8	Santa Cruz, Cal	647	79	14	353	161	84	32	11	4	292	2	.....	2
		681	*89*	*11*	*410*	*171*	*69*	*12*	*10*	*1*	*263*	*8*	.....	*8*
9	Stockton, Cal	1,192	139	9	881	242	138	59	17	6	462	46	.....	46
		1,019	*130*	*12*	*668*	*189*	*91*	*26*	*6*	.....	*312*	*39*	.....	*39*
10	Vallejo, Cal	553	78	11	305	126	64	30	8	1	229	19	.....	19
		504	*69*	*10*	*311*	*111*	*50*	*6*	*3*	.....	*180*	*13*	.....	*13*
11	Canon City, Colo	426	58	12	237	99	51	17	16	1	184	5	.....	5
		343	*47*	*14*	*201*	*79*	*27*	*25*	*6*	*1*	*138*	*4*	.....	*4*
12	Grand Junction, Colo	679	78	10	344	160	88	46	26	9	329	6	.....	6
		618	*76*	*13*	*360*	*118*	*75*	*35*	*18*	*6*	*252*	*6*	.....	*6*
13	Ansonia, Conn	1,222	149	12	694	168	98	41	10	4	321	204	3	207
		1,161	*136*	*8*	*676*	*150*	*64*	*17*	*5*	*1*	*238*	*243*	*4*	*247*
14	Danbury, Conn	1,182	142	12	619	231	105	49	24	3	412	150	1	151
		1,046	*130*	*12*	*588*	*188*	*88*	*28*	*10*	*6*	*330*	*131*	*7*	*138*
15	Middletown, Conn	618	87	14	339	82	42	20	20	8	172	102	5	107
		490	*73*	*15*	*269*	*70*	*32*	*16*	*5*	*5*	*128*	*88*	*5*	*93*
16	Naugatuck, Conn	851	115	7	524	152	57	22	4	8	243	78	6	84
		853	*106*	*8*	*500*	*128*	*52*	*16*	*7*	*3*	*206*	*112*	*15*	*127*
17	Torrington, Conn	763	103	11	402	122	46	19	14	3	204	147	10	157
		755	*98*	*7*	*428*	*87*	*34*	*10*	*3*	*3*	*137*	*175*	*15*	*190*
18	Wallingford, Conn	913	113	8	451	100	55	24	4	5	188	256	18	274
		864	*104*	*11*	*428*	*81*	*21*	*20*	*6*	.....	*128*	*257*	*41*	*298*

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19	Pensacola, Fla.	1,181	165	8	504	232	187	120	62	56	657	20	.....	20
		1,472	*189*	*8*	*658*	*279*	*218*	*143*	*91*	*61*	*791*	*29*	.....	*29*
20	Athens, Ga.	571	82	10	309	95	63	42	24	19	243	18	1	19
		588	*85*	*12*	*301*	*134*	*76*	*35*	*19*	*16*	*268*	*19*	.....	*19*
21	Columbus, Ga.	1,277	174	8	527	315	213	125	55	36	744	6	.....	6
		1,302	*194*	*10*	*533*	*323*	*205*	*133*	*68*	*33*	*762*	*7*	.....	*7*
22	Dalton, Ga.	445	59	12	165	105	69	55	24	24	277	3	.....	3
		468	*68*	*9*	*197*	*107*	*82*	*43*	*22*	*14*	*268*	*3*	.....	*3*
23	Lagrange, Ga.	454	65	6	205	89	66	40	31	15	241	8	.....	8
		503	*65*	*10*	*262*	*87*	*64*	*34*	*24*	*22*	*231*	*10*	.....	*10*
24	Pocatello, Idaho	457	60	7	266	84	56	25	9	3	177	14	.....	14
		492	*62*	*7*	*303*	*104*	*49*	*14*	*8*	*1*	*176*	*13*	.....	*13*
25	Alton, Ill.	936	147	12	599	184	83	33	11	7	318	19	.....	19
		953	*138*	*13*	*638*	*155*	*94*	*35*	*12*	.....	*296*	*18*	1	*19*
26	Belleville, Ill.	1,274	175	13	962	239	106	36	14	7	402	10	.....	10
		1,211	*163*	*10*	*942*	*188*	*50*	*20*	*4*	*2*	*264*	*5*	.....	*5*
27	Canton, Ill.	769	93	8	403	164	111	51	18	7	351	15	.....	15
		709	*96*	*13*	*455*	*141*	*63*	*27*	*8*	*3*	*242*	*12*	.....	*12*
28	Centralia, Ill.	718	85	12	442	143	80	28	13	5	269	7	.....	7
		728	*97*	*10*	*485*	*136*	*59*	*27*	*5*	*5*	*252*	*11*	.....	*11*
29	Champaign, Ill.	694	89	6	445	112	78	22	4	3	219	29	1	30
		715	*97*	*6*	*494*	*109*	*60*	*16*	*6*	*1*	*192*	*29*	.....	*29*
30	Chicago Heights, Ill.	739	91	6	409	161	97	39	24	7	328	12	.....	12
		646	*109*	*8*	*377*	*153*	*75*	*25*	*5*	*5*	*263*	*6*	.....	*6*
31	Clinton, Ill.	475	60	8	306	81	52	20	6	7	166	3	.....	3
		463	*57*	*9*	*311*	*92*	*40*	*11*	.....	*2*	*145*	*7*	.....	*7*
32	De Kalb, Ill.	575	80	12	386	126	26	12	5	3	172	17	.....	19
		581	*74*	*9*	*439*	*81*	*24*	*3*	*2*	.....	*110*	*31*	1	*32*
33	Evanston (Dist. No. 76), Ill.	502	62	6	325	102	53	13	2	1	171	6	.....	6
		485	*60*	*7*	*329*	*83*	*37*	*11*	*2*	*1*	*134*	*2*	.....	*2*
34	Evanston (Dist. No. 75), Ill.	1,001	120	7	657	182	84	38	14	6	324	20	.....	20
		891	*114*	*11*	*619*	*144*	*79*	*22*	*7*	*3*	*255*	*17*	.....	*17*
35	Freeport, Ill.	1,059	135	13	386	349	190	96	30	8	673	.....	.....	.....
		1,040	*130*	*12*	*432*	*337*	*119*	*58*	*20*	*2*	*608*	.....	.....	.....
36	Galesburg, Ill.	1,323	169	11	882	263	87	33	10	8	401	40	.....	40
		1,318	*170*	*10*	*948*	*223*	*72*	*26*	*5*	*3*	*329*	*41*	.....	*41*
37	Jacksonville, Ill.	801	93	9	427	164	114	60	17	9	364	10	.....	10
		837	*106*	*12*	*497*	*174*	*88*	*45*	*12*	*5*	*324*	*16*	.....	*16*
38	Kankakee, Ill.	820	101	13	500	142	77	36	8	1	264	52	4	56
		804	*102*	*12*	*549*	*117*	*42*	*12*	*3*	.....	*174*	*77*	*4*	*81*
39	La Salle, Ill.	519	97	7	462	37	18	.....	.....	.....	55	2	.....	2
		499	*94*	*7*	*446*	*32*	*1*	.....	.....	.....	*33*	*20*	.....	*20*
40	Macomb, Ill.	357	44	9	179	71	57	29	7	5	169	8	1	9
		349	*46*	*10*	*217*	*62*	*41*	*13*	*8*	*1*	*125*	*6*	*1*	*7*
41	Mattoon, Ill.	942	122	8	528	190	111	63	21	6	391	23	.....	23
		908	*113*	*6*	*574*	*176*	*81*	*44*	*7*	*3*	*311*	*23*	.....	*23*
42	Maywood and Melrose Park, Ill.	895	141	10	520	211	91	37	12	12	363	12	.....	12
		799	*111*	*8*	*522*	*165*	*65*	*23*	*7*	*3*	*263*	*14*	.....	*14*

[1] For definition of normal age, see footnote page 12.

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TABLE 6.—*The number of pupils of normal age, more than normal age, and less than the normal age of pupils in their respective grades in certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total of all ages.	Largest age group.	Age of largest group.	Of normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years or more.	Total.
43	Moline, Ill	1,297	157	11	861	278	96	28	6	4	412	24	.....	24
		1,208	*160*	*10*	*888*	*195*	*65*	*9*	*4*	*2*	*275*	*43*	*2*	*45*
44	Ottawa, Ill	657	84	7	492	103	43	12	.....	.....	158	9	.....	9
		666	*83*	*9*	*510*	*100*	*30*	*11*	.....	.....	*141*	*15*	.....	*15*
45	Pekin, Ill	699	91	6	427	142	77	30	13	3	265	6	1	7
		705	*95*	*9*	*514*	*113*	*49*	*18*	*3*	*1*	*184*	*7*	.....	*7*
46	Rock Island, Ill	1,365	169	10	937	186	91	21	3	4	305	121	2	123
		1,380	*174*	*11*	*994*	*167*	*41*	*13*	*8*	*2*	*231*	*153*	*2*	*155*
47	Streator, Ill	980	134	7	562	216	131	45	15	1	408	10	.....	10
		965	*131*	*8*	*578*	*243*	*93*	*33*	*7*	*1*	*377*	*10*	.....	*10*
48	Waukegan, Ill	841	113	7	612	121	63	16	4	4	208	21	.....	21
		833	*111*	*10*	*611*	*122*	*46*	*9*	*6*	*2*	*185*	*34*	*3*	*37*
49	Alexandria, Ind	321	42	8	200	58	31	12	2	.....	103	18	.....	18
		372	*50*	*8*	*254*	*62*	*28*	*7*	*2*	*2*	*101*	*17*	.....	*17*
50	Bedford, Ind	711	91	12	442	144	76	28	10	4	262	7	.....	7
		625	*82*	*9*	*455*	*100*	*41*	*13*	*4*	*1*	*159*	*10*	*1*	*11*
51	Connersville, Ind	415	57	12	264	74	42	18	7	3	144	7	.....	7
		477	*60*	*7*	*342*	*79*	*34*	*10*	*4*	*1*	*128*	*7*	.....	*7*
52	Crawfordsville, Ind	576	74	8	351	115	43	42	10	.....	210	15	.....	15
		568	*77*	*8*	*383*	*92*	*43*	*15*	*2*	.....	*152*	*33*	.....	*33*
53	East Chicago, Ind	701	104	11	416	145	69	25	8	6	253	31	1	32
		535	*97*	*9*	*313*	*115*	*51*	*16*	*8*	*2*	*192*	*29*	*1*	*30*
54	Frankfort, Ind	770	99	8	501	143	74	22	12	2	253	16	.....	16
		734	*105*	*13*	*496*	*137*	*62*	*17*	*3*	*1*	*220*	*18*	.....	*18*
55	Goshen, Ind	561	74	11	309	123	66	24	10	5	228	23	1	24
		531	*84*	*11*	*326*	*72*	*34*	*10*	*3*	*1*	*120*	*67*	*18*	*85*
56	Kokomo, Ind	1,045	130	8	653	205	120	40	11	6	382	10	.....	10
		1,179	*163*	*10*	*840*	*199*	*77*	*32*	*7*	.....	*315*	*24*	.....	*24*
57	La Porte, Ind	424	60	14	263	93	34	13	7	6	153	8	.....	8
		434	*55*	*13*	*299*	*76*	*37*	*10*	*1*	.....	*124*	*10*	*1*	*11*
58	Lebanon, Ind	378	49	14	197	91	55	27	4	1	178	3	.....	3
		425	*57*	*11*	*276*	*86*	*46*	*11*	*2*	.....	*145*	*4*	.....	*4*
59	Logansport, Ind	1,132	131	11	633	293	141	38	12	3	487	12	.....	12
		1,025	*134*	*10*	*648*	*221*	*103*	*24*	*9*	*3*	*360*	*17*	.....	*17*
60	Michigan City, Ind	895	114	10	538	198	109	34	8	.....	349	8	.....	8
		835	*107*	*8*	*577*	*165*	*53*	*22*	*2*	*2*	*244*	*14*	.....	*14*

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61	Peru, Ind	740	100	8	457	153	59	19	5	3	239	34	10	44
		704	*99*	*8*	*472*	*138*	*43*	*11*	*3*	.....	*195*	*36*	*1*	*37*
62	Wabash, Ind	670	92	10	493	96	51	13	1	.....	161	16	.....	16
		653	*89*	*8*	*434*	*75*	*16*	*1*	*1*	.....	*93*	*28*	.....	*26*
63	Clinton, Iowa	941	125	13	460	263	138	52	14	7	474	7	.....	7
		932	*132*	*8*	*504*	*257*	*103*	*39*	*10*	*3*	*412*	*16*	.....	*16*
64	Creston, Iowa	525	68	10	335	72	38	14	4	1	129	59	2	61
		463	*66*	*7*	*320*	*54*	*19*	*5*	*1*	*1*	*80*	*60*	*3*	*63*
65	Iowa City, Iowa	511	62	7	339	81	26	11	3	6	127	44	1	45
		510	*71*	*11*	*361*	*58*	*35*	*7*	*1*	.....	*101*	*46*	*2*	*48*
66	Keokuk, Iowa	832	102	7	463	145	80	38	16	7	286	83	.....	83
		815	*95*	*12*	*537*	*122*	*48*	*17*	*15*	*2*	*204*	*73*	*1*	*74*
67	Marshalltown, Iowa	846	102	8	440	204	120	51	17	4	396	10	.....	10
		951	*109*	*8*	*565*	*184*	*112*	*48*	*18*	*7*	*369*	*16*	*1*	*17*
68	Mason City, Iowa	677	83	9	389	148	70	24	15	3	260	27	1	28
		623	*118*	*14*	*427*	*119*	*51*	*8*	.....	.....	*178*	*17*	*1*	*18*
69	Muscatine, Iowa	822	102	12	489	135	46	24	11	4	220	109	4	113
		841	*121*	*12*	*548*	*75*	*27*	*13*	*4*	.....	*119*	*167*	*7*	*174*
70	Oskaloosa, Iowa	650	88	12	365	152	77	29	6	4	268	17	.....	17
		644	*92*	*14*	*377*	*137*	*73*	*26*	*10*	*5*	*251*	*15*	*1*	*16*
71	Ottumwa, Iowa	1,764	230	10	1,011	313	181	58	13	9	574	176	3	176
		1,824	*219*	*8*	*1,120*	*291*	*136*	*35*	*12*	*7*	*481*	*221*	*2*	*223*
72	Arkansas City, Kans	586	76	13	328	115	78	47	19	6	265	3	.....	3
		537	*71*	*9*	*328*	*107*	*44*	*34*	*11*	*2*	*198*	*11*	.....	*11*
73	Emporia, Kans	587	71	12	240	153	103	55	23	13	347	.....	.....	.....
		697	*98*	*12*	*349*	*153*	*100*	*40*	*14*	*33*	*340*	*8*	.....	*8*
74	Hutchinson, Kans	1,014	127	10	582	237	117	52	19	3	428	4	.....	4
		956	*112*	*13*	*589*	*205*	*95*	*46*	*9*	*3*	*358*	*9*	.....	*9*
75	Parsons, Kans	802	103	13	413	203	111	54	12	6	386	3	.....	3
		820	*92*	*7*	*463*	*219*	*77*	*36*	*14*	*4*	*350*	*7*	.....	*7*
76	Owensboro, Ky	724	88	14	431	157	70	33	21	6	287	5	1	6
		718	*101*	*13*	*470*	*122*	*57*	*30*	*10*	*5*	*224*	*23*	*1*	*24*
77	Shreveport, La	812	105	11	282	218	170	75	33	20	516	4	.....	4
		893	*114*	*8*	*366*	*269*	*160*	*58*	*25*	*7*	*519*	*7*	*1*	*8*
78	Bangor, Me	1,371	164	7	830	230	74	38	9	1	352	179	10	189
		1,278	*230*	*11*	*700*	*165*	*74*	*59*	*3*	*5*	*306*	*230*	*42*	*272*
79	Waterville, Me	561	86	13	322	102	54	28	7	5	196	43	.....	43
		534	*70*	*12*	*327*	*86*	*35*	*18*	*4*	*1*	*144*	*58*	*5*	*63*
80	Cumberland, Md	1,136	153	10	410	265	223	127	57	41	713	4	.....	4
		1,287	*178*	*8*	*540*	*357*	*228*	*110*	*36*	*13*	*744*	*3*	.....	*3*
81	Hagerstown, Md	965	139	10	352	257	187	117	40	9	610	3	.....	3
		956	*128*	*8*	*418*	*261*	*153*	*77*	*32*	*9*	*532*	*6*	.....	*6*
82	Adams, Mass	790	102	10	457	77	28	17	7	7	136	184	13	197
		766	*105*	*9*	*435*	*66*	*21*	*10*	*5*	*4*	*106*	*194*	*21*	*215*
83	Attleboro, Mass	1,059	126	7	592	165	69	28	11	16	289	173	5	178
		1,009	*175*	*14*	*558*	*133*	*71*	*20*	*15*	*8*	*247*	*200*	*4*	*204*
84	Beverly, Mass	1.308	143	10	695	122	38	8	1	.....	169	435	9	444
		1,288	*149*	*8*	*807*	*95*	*39*	*5*	*2*	.....	*141*	*422*	*18*	*440*
85	Danvers, Mass	655	85	13	369	50	21	6	.....	.....	77	204	5	209
		613	*75*	*11*	*280*	*41*	*11*	*4*	.....	.....	*56*	*268*	*9*	*277*
86	Dedham, Mass	678	83	7	340	25	14	4	4	.....	47	277	14	291
		690	*104*	*6*	*275*	*22*	*14*	*2*	.....	.....	*38*	*315*	*62*	*377*

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TABLE 6.—*The number of pupils of normal age, more than normal age, and less than the normal age of pupils in their respective grades in certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total of all ages.	Largest age group.	Age of largest group.	Of normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years or more.	Total.
87	Framingham, Mass	971	126	10	485	75	25	3	1	.....	104	337	45	382
		921	*109*	*12*	*486*	*46*	*23*	*5*	*7*	*1*	*82*	*327*	*30*	*357*
88	Gardner, Mass	744	93	7	401	64	54	23	6	7	154	183	6	189
		717	*90*	*10*	*374*	*58*	*35*	*14*	*6*	*3*	*116*	*219*	*8*	*227*
89	Marlboro, Mass	1,087	136	12	628	155	68	27	11	5	266	189	4	193
		1,034	*121*	*8*	*617*	*134*	*52*	*18*	*6*	*3*	*213*	*204*	.....	*204*
90	Melrose, Mass	1,285	166	12	691	99	26	6	1	.....	132	443	19	462
		1,313	*149*	*9*	*648*	*73*	*19*	*2*	*1*	.....	*95*	*558*	*12*	*570*
91	Medford, Mass	1,739	197	11	867	100	43	7	1	.....	151	656	65	721
		1,738	*205*	*11*	*832*	*102*	*19*	*2*	.....	.....	*123*	*670*	*113*	*783*
92	Milford, Mass	894	117	6	462	101	43	25	9	10	188	230	14	244
		884	*123*	*6*	*440*	*68*	*32*	*25*	*5*	*3*	*133*	*300*	*11*	*311*
93	Montague, Mass	496	58	13	241	46	23	8	.....	1	78	165	12	177
		432	*59*	*7*	*205*	*22*	*8*	.....	*1*	*1*	*32*	*185*	*10*	*195*
94	Natick, Mass	717	84	10	350	54	14	5	2	.....	75	285	7	292
		739	*99*	*10*	*369*	*33*	*12*	*4*	*1*	*2*	*52*	*311*	*7*	*318*
95	Newburyport, Mass	743	116	13	374	61	17	10	4	1	93	260	16	276
		739	*89*	*12*	*330*	*41*	*16*	*6*	*1*	*1*	*65*	*321*	*23*	*344*
96	North Attleboro, Mass	612	73	8	343	80	40	19	7	8	154	109	6	115
		560	*84*	*12*	*199*	*85*	*36*	*8*	*1*	.....	*130*	*120*	*11*	*131*
97	Norwood, Mass	683	80	12	382	52	21	6	1	0	80	209	12	221
		717	*94*	*12*	*415*	*49*	*8*	*5*	*2*	*0*	*64*	*227*	*13*	*240*
98	Northbridge, Mass	664	86	6	359	101	35	25	4	3	168	131	6	137
		597	*87*	*9*	*350*	*69*	*35*	*9*	*5*	*6*	*121*	*122*	*4*	*126*
99	Peabody, Mass	931	113	12	530	109	38	14	3	2	166	226	9	235
		864	*105*	*12*	*415*	*97*	*40*	*15*	*4*	*1*	*157*	*273*	*19*	*292*
100	Revere, Mass	1,433	182	12	801	111	42	10	3	1	167	437	28	465
		1,297	*160*	*6*	*705*	*94*	*23*	*22*	*3*	*4*	*126*	*446*	*22*	*468*
101	Wakefield, Mass	923	115	12	462	75	26	6	4	.....	111	335	15	350
		887	*118*	*12*	*433*	*57*	*21*	*8*	*1*	*3*	*70*	*361*	*23*	*384*
102	Westfield, Mass	817	114	12	492	141	44	25	5	1	216	108	1	109
		820	*103*	*10*	*538*	*110*	*29*	*7*	*8*	*4*	*158*	*123*	*1*	*124*
103	West Springfield, Mass	788	111	8	516	111	50	12	6	1	180	90	2	92
		762	*95*	*12*	*519*	*95*	*29*	*9*	*2*	*0*	*135*	*102*	*6*	*108*
104	Weymouth, Mass	1,009	115	13	512	120	60	30	2	0	212	271	14	285
		956	*114*	*8*	*464*	*117*	*67*	*33*	*1*	*1*	*219*	*259*	*14*	*273*
105	Winchester (town), Mass	760	90	10	393	75	29	4	4	0	112	232	23	255
		718	*104*	*8*	*387*	*43*	*11*	*5*	*1*	*0*	*60*	*246*	*25*	*271*

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106	Winthrop, Mass.	763	84	7	428	60	18	1	1	0	80	239	16	255
		710	*85*	*8*	*389*	*46*	*8*	*2*	*0*	*0*	*56*	*241*	*24*	*265*
107	Woburn, Mass.	1,393	169	12	719	161	65	19	3	2	250	401	23	423
		1,184	*140*	*8*	*594*	*117*	*47*	*17*	*8*	*1*	*190*	*386*	*14*	*390*
108	Ann Arbor, Mich.	877	100	11	493	172	98	40	15	3	328	56	0	56
		825	*98*	*6*	*550*	*140*	*49*	*20*	*4*	*0*	*213*	*62*	*0*	*62*
109	Cadillac, Mich.	742	100	8	404	162	79	38	25	5	309	29	0	29
		722	*104*	*14*	*450*	*136*	*64*	*23*	*4*	*3*	*250*	*39*	*3*	*42*
110	Cheboygan, Mich.	524	67	9	265	101	62	32	19	8	222	34	3	37
		495	*66*	*8*	*277*	*103*	*42*	*19*	*10*	*1*	*175*	*43*	*0*	*43*
111	Escanaba, Mich.	906	110	13	684	105	42	19	4	5	175	45	2	47
		869	*116*	*7*	*707*	*88*	*11*	*11*	*0*	*1*	*105*	*57*	*0*	*57*
112	Hancock, Mich.	565	81	8	293	118	65	17	7	6	213	57	2	59
		491	*63*	*8*	*260*	*127*	*47*	*13*	*0*	*4*	*191*	*40*	*0*	*40*
113	Holland, Mich.	696	81	7	276	132	55	18	5	0	207	13	0	13
		735	*101*	*12*	*540*	*115*	*38*	*13*	*6*	*0*	*172*	*23*	*0*	*23*
114	Iron Mountain, Mich.	927	124	14	464	229	130	66	21	5	451	12	0	12
		877	*113*	*9*	*522*	*214*	*84*	*26*	*3*	*2*	*344*	*21*	*0*	*21*
115	Ironwood, Mich.	890	116	7	566	179	77	37	1	4	298	26	0	26
		855	*119*	*8*	*603*	*120*	*68*	*5*	*1*	*2*	*196*	*56*	*0*	*56*
116	Ishpeming, Mich.	974	141	9	685	141	62	19	8	1	231	56	2	58
		945	*123*	*7*	*756*	*88*	*35*	*12*	*1*	*2*	*138*	*49*	*2*	*51*
117	Lansing, Mich.	1,451	174	12	726	318	216	99	45	13	691	33	1	34
		1,426	*181*	*10*	*816*	*332*	*150*	*62*	*21*	*7*	*572*	*38*	*0*	*38*
118	Marquette, Mich.	836	100	8	487	127	81	24	10	7	249	97	3	100
		760	*90*	*6*	*500*	*103*	*46*	*10*	*8*	*1*	*168*	*92*	*0*	*92*
119	Menominee, Mich.	890	118	8	524	202	93	35	18	4	352	14	0	14
		778	*100*	*7*	*587*	*144*	*60*	*14*	*5*	*1*	*224*	*27*	*0*	*27*
120	Muskegon, Mich.	1,397	176	12	852	296	147	62	23	5	532	13	0	13
		1,369	*179*	*13*	*918*	*289*	*110*	*30*	*7*	*1*	*437*	*14*	*0*	*14*
121	Sault Ste. Marie, Mich.	849	111	7	432	191	94	49	17	5	356	57	4	61
		815	*129*	*8*	*394*	*217*	*133*	*43*	*16*	*9*	*418*	*3*	*0*	*3*
122	Meridian, Miss.	1,153	155	8	546	217	133	85	46	28	509	98	0	98
		1,161	*131*	*10*	*570*	*219*	*129*	*77*	*19*	*21*	*465*	*123*	*3*	*126*
123	Carthage, Mo.	747	90	9	430	142	88	45	17	5	297	18	2	20
		740	*91*	*8*	*445*	*163*	*73*	*26*	*5*	*4*	*271*	*24*	*0*	*24*
124	Great Falls, Mont.	1,021	128	10	629	197	103	42	13	15	370	22	0	22
		987	*131*	*11*	*657*	*173*	*86*	*32*	*10*	*7*	*308*	*22*	*0*	*22*
125	Concord, N. H.	991	114	11	544	180	107	42	14	14	357	88	2	90
		1,031	*117*	*7*	*590*	*185*	*89*	*30*	*14*	*4*	*322*	*116*	*3*	*119*
126	Portsmouth, N. H.	603	84	6	391	97	41	13	5	4	160	51	1	52
		637	*81*	*7*	*421*	*93*	*36*	*12*	*5*	*1*	*147*	*65*	*4*	*69*
127	Bloomfield, N. J.	856	121	9	538	146	56	33	6	4	245	70	3	73
		807	*120*	*9*	*518*	*105*	*49*	*21*	*7*	*1*	*185*	*91*	*15*	*106*
128	Bridgeton, N. J.	856	100	10	430	109	80	38	16	9	252	163	10	173
		843	*101*	*10*	*420*	*101*	*45*	*21*	*7*	*4*	*178*	*228*	*17*	*245*
129	Garfield, N. J.	596	88	8	325	130	76	34	8	1	249	22	0	22
		569	*100*	*8*	*316*	*139*	*63*	*20*	*7*	*2*	*231*	*22*	*0*	*22*
130	Kearny, N. J.	1,244	158	12	701	245	125	35	20	1	426	116	1	117
		1,205	*146*	*11*	*710*	*219*	*101*	*39*	*8*	*2*	*369*	*122*	*4*	*126*
131	Long Branch, N. J.	904	119	15	393	170	133	82	49	19	453	57	1	58
		961	*125*	*13*	*494*	*172*	*120*	*78*	*25*	*7*	*402*	*63*	*2*	*65*

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TABLE 6.—*The number of pupils of normal age, more than normal age, and less than the normal age of pupils in their respective grades in certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total of all ages.	Largest age group.	Age of largest group.	Normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years or more.	Total.
132	Irvington, N. J.	775	93	10	427	157	85	22	[illegible]	0	271	77	0	77
		716	*104*	*6*	*396*	*108*	*40*	*11*	[illegible]	*0*	*163*	*138*	*19*	*157*
133	Montclair, N. J.	1,226	159	10	686	222	130	68	[illegible]	20	464	75	1	76
		1,098	*127*	*10*	*644*	*185*	*111*	*59*	[illegible]	*13*	*385*	*69*	*0*	*69*
134	Morristown, N. J.	613	75	14	308	127	69	37	29	8	270	35	0	35
		547	*75*	*11*	*283*	*116*	*70*	*25*	*7*	*2*	*220*	*38*	*3*	*41*
135	Plainfield, N. J.	1,102	137	8	589	209	140	73	22	5	449	62	2	64
		1,089	*138*	*10*	*581*	*234*	*125*	*47*	*11*	*10*	*427*	*76*	*5*	*81*
136	Town of Union, N. J.	1,302	168	9	554	270	206	[illegible]	31	7	602	46	0	46
		1,283	*179*	*9*	*680*	*316*	*166*	[illegible]	*13*	*4*	*550*	*53*	*0*	*53*
137	Vineland, N. J.	742	101	12	195	238	162	91	30	17	538	9	0	9
		662	*89*	*9*	*214*	*198*	*134*	*75*	*20*	*9*	*436*	*11*	*1*	*12*
138	West New York, N. J.	995	137	7	621	170	82	[illegible]	8	1	304	66	4	70
		1,026	*139*	*8*	*665*	*164*	*67*	*22*	*9*	*1*	*263*	*93*	*5*	*98*
139	West Orange, N. J.	675	92	8	338	142	115	49	14	8	328	9	0	9
		620	*85*	*8*	*360*	*120*	*80*	*29*	*7*	*3*	*239*	*20*	*1*	*21*
140	Albuquerque, N. Mex.	686	79	13	227	140	98	53	19	36	346	13	0	13
		628	*85*	*8*	*345*	*134*	*66*	*36*	*19*	*17*	*272*	*11*	*0*	*11*
141	Amsterdam, N. Y.	1,203	157	10	705	226	131	57	25	18	457	40	1	41
		1,260	*162*	*11*	*750*	*228*	*114*	[illegible]	*15*	*28*	*448*	*61*	*1*	*62*
142	Dunkirk, N. Y.	771	103	9	398	136	78	[illegible]	17	7	262	103	8	111
		758	*140*	*7*	*431*	*141*	*64*	[illegible]	*3*	*3*	*228*	*99*	.....	*99*
143	Gloversville, N. Y.	1,190	155	11	623	217	129	43	17	5	411	143	13	156
		1,066	*147*	*11*	*618*	*159*	*82*	*33*	*17*	*6*	*297*	*136*	*15*	*151*
144	Johnstown, N. Y.	656	87	12	326	173	86	39	12	8	318	12	0	12
		607	*83*	*12*	*295*	*155*	*83*	*41*	*19*	*9*	*307*	*5*	*0*	*5*
145	New Rochelle, N. Y.	1,899	250	8	843	472	290	151	53	18	984	69	3	72
		1,671	*192*	*11*	*895*	*403*	*229*	*104*	*50*	*18*	*804*	*72*	*0*	*72*
146	Olean, N. Y.	920	127	11	514	195	103	34	10	5	347	57	2	59
		891	*116*	*8*	*553*	*165*	*77*	*25*	*6*	*2*	*275*	*61*	*2*	*63*
147	Port Chester, N. Y.	861	113	10	522	162	87	24	7	2	282	54	3	57
		840	*123*	*8*	*501*	*159*	*78*	*26*	*10*	*4*	*277*	*58*	*4*	*62*
148	White Plains, N. Y.	737	120	10	381	164	92	47	20	7	330	25	1	26
		791	*103*	*9*	*417*	*88*	*45*	*20*	*5*	*2*	*160*	*180*	*34*	*214*
149	Asheville, N. C.	1,303	172	9	464	270	200	172	88	96	826	13	0	1
		1,297	*177*	*10*	*474*	*268*	*217*	*152*	*88*	*90*	*815*	*8*	*0*	*83*
150	Newbern, N. C.	485	62	11	145	99	97	51	54	39	340	0	0	.....
		630	*86*	*12*	*201*	*117*	*116*	*87*	*56*	*50*	*426*	*2*	*0*	*2*

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151	Alliance, Ohio	1,047	141	8	592	273	129	37	8	6	453	2	0	2
		1,048	*141*	*7*	*690*	*239*	*85*	*21*	*7*	*1*	*363*	*5*	*0*	*5*
152	Newark, Ohio	1,583	192	7	954	306	144	40	17	10	517	42	0	42
		1,343	*191*	*11*	*942*	*255*	*78*	*31*	*6*	*2*	*372*	*29*	*0*	*29*
153	Norwood, Ohio	696	92	11	466	115	61	22	14	2	214	16	0	16
		702	*89*	*8*	*493*	*96*	*61*	*22*	*4*	*1*	*184*	*25*	*0*	*25*
154	Portsmouth, Ohio	1,541	180	13	867	283	192	86	41	27	629	45	0	45
		1,489	*215*	*10*	*950*	*237*	*129*	*56*	*24*	*7*	*453*	*56*	*0*	*56*
155	Sidney, Ohio	424	57	6	239	64	41	17	13	3	138	45	2	47
		453	*70*	*10*	*285*	*66*	*37*	*9*	*3*	*0*	*115*	*52*	*1*	*53*
156	Steubenville, Ohio	1,193	141	8	560	277	170	81	45	16	589	44	0	44
		1,215	*138*	*11*	*617*	*299*	*166*	*62*	*17*	*9*	*553*	*45*	*0*	*45*
157	Enid, Okla.	830	104	10	453	188	95	50	21	4	358	18	1	19
		839	*101*	*11*	*539*	*140*	*99*	*36*	*2*	*1*	*278*	*22*	*0*	*22*
158	McAlester, Okla.	535	63	12	227	100	80	52	34	35	301	5	2	7
		500	*61*	*6*	*245*	*99*	*71*	*42*	*20*	*17*	*249*	*4*	*2*	*6*
159	Beaver Falls, Pa.	692	103	10	362	158	109	37	10	2	316	14	0	14
		663	*83*	*6*	*376*	*141*	*89*	*27*	*7*	*2*	*266*	*21*	*0*	*21*
160	Carbondale, Pa.	1,167	153	10	745	199	86	37	7	0	329	87	6	93
		1,165	*161*	*10*	*771*	*183*	*72*	*33*	*0*	*0*	*288*	*103*	*3*	*106*
161	Carlisle, Pa.	660	92	12	427	97	51	20	6	4	178	53	2	55
		674	*100*	*10*	*475*	*80*	*32*	*24*	*3*	*1*	*140*	*54*	*5*	*59*
162	Charleroi, Pa.	742	105	9	361	182	125	55	16	0	378	3	0	3
		769	*96*	*10*	*373*	*197*	*116*	*54*	*11*	*2*	*380*	*16*	*0*	*16*
163	Clearfield, Pa.	546	66	10	317	111	64	32	8	2	217	12	0	12
		507	*73*	*12*	*319*	*95*	*66*	*21*	*4*	*1*	*187*	*11*	*0*	*11*
164	Columbia, Pa.	765	93	10	498	118	54	27	10	4	213	49	5	54
		788	*106*	*12*	*540*	*99*	*50*	*18*	*5*	*0*	*172*	*70*	*6*	*76*
165	Donora, Pa.	499	70	8	275	108	70	24	14	3	219	5	0	5
		478	*81*	*8*	*321*	*90*	*27*	*9*	*0*	*1*	*127*	*26*	*4*	*30*
166	Franklin, Pa.	535	69	13	318	127	55	15	5	4	206	11	0	11
		553	*79*	*12*	*362*	*111*	*38*	*13*	*5*	*1*	*168*	*23*	*0*	*23*
167	Homestead, Pa.	837	112	10	444	192	100	54	16	9	371	22	0	22
		781	*121*	*6*	*492*	*135*	*74*	*34*	*10*	*2*	*255*	*34*	*0*	*34*
168	Lebanon, Pa.	1,274	153	12	851	193	70	35	11	3	312	105	6	111
		1,214	*152*	*12*	*865*	*153*	*46*	*19*	*7*	*4*	*229*	*112*	*8*	*110*
169	Mahanoy City, Pa.	1,067	157	7	532	240	148	79	23	24	514	10	1	11
		1,118	*155*	*11*	*565*	*261*	*160*	*67*	*42*	*12*	*542*	*11*	*0*	*11*
170	North Braddock, Pa.	968	132	6	498	206	128	85	34	9	462	7	1	8
		973	*135*	*8*	*540*	*242*	*111*	*60*	*12*	*3*	*428*	*5*	*0*	*5*
171	Plymouth, Pa.	1,032	152	6	643	190	93	33	18	5	339	50	0	50
		983	*145*	*6*	*625*	*199*	*84*	*19*	*6*	*4*	*312*	*45*	*1*	*46*
172	Pottstown, Pa.	1,040	137	12	701	144	91	34	9	6	284	53	2	55
		1,007	*132*	*12*	*751*	*102*	*51*	*18*	*12*	*3*	*186*	*68*	*2*	*70*
173	Sharon, Pa.	911	112	8	643	117	60	36	7	7	227	41	0	41
		880	*111*	*6*	*662*	*118*	*37*	*15*	*1*	*2*	*173*	*44*	*1*	*45*
174	Sunbury, Pa.	977	117	11	632	180	85	18	14	10	307	36	2	38
		944	*123*	*11*	*656*	*138*	*79*	*18*	*6*	*1*	*242*	*44*	*1*	*45*
175	Warren, Pa.	862	99	13	494	189	104	48	10	3	354	13	1	[illegible]
		840	*102*	*13*	*516*	*201*	*76*	*19*	*9*	*4*	*309*	*13*	*2*	[illegible]
176	Central Falls, R. I.	699	92	13	373	84	49	32	13	7	185	136	5	[illegible]
		680	*94*	*13*	*368*	*78*	*37*	*17*	*5*	*3*	*140*	*164*	*10*	[illegible]

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TABLE 6.—*The number of pupils of normal age, more than normal age, and less than the normal age of pupils in their respective grades in certain cities of less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Total of all ages.	Largest age group.	Age of largest group.	Normal age.	Over age.						Under age.		
						1 year.	2 years.	3 years.	4 years.	5 years or more.	Total.	1 year.	2 years or more.	Total.
177	Spartanburg, S. C.	1,003	164	8	401	271	156	86	64	22	599	3	0	3
		1,231	*173*	*10*	*512*	*256*	*218*	*106*	*73*	*57*	*710*	*9*	*0*	*9*
178	Beaumont, Tex.	1,124	174	7	339	325	209	139	85	26	784	1	0	1
		1,262	*166*	*9*	*370*	*381*	*225*	*167*	*86*	*30*	*889*	*3*	*0*	*3*
179	Ogden, Utah	2,046	234	10	921	472	304	114	32	12	934	174	17	191
		1,983	*236*	*12*	*1,094*	*554*	*227*	*70*	*12*	*6*	*869*	*20*	*0*	*20*
180	Everett, Wash.	1,425	181	9	858	276	125	38	10	3	452	107	8	115
		1,479	*194*	*12*	*1,004*	*226*	*70*	*29*	*8*	*2*	*335*	*131*	*9*	*140*
181	Clarksburg, W. Va.	833	118	6	440	160	105	53	30	23	371	22	0	22
		752	*100*	*6*	*443*	*142*	*75*	*37*	*13*	*11*	*278*	*30*	*1*	*31*
182	Appleton, Wis.	788	97	8	496	151	76	36	13	0	276	16	0	16
		786	*100*	*7*	*564*	*143*	*39*	*16*	*4*	*0*	*202*	*20*	*0*	*20*
183	Beloit, Wis.	1,075	127	11	668	215	111	41	12	9	388	19	0	19
		1,037	*136*	*13*	*682*	*203*	*84*	*32*	*11*	*2*	*332*	*23*	*0*	*23*
184	Fond du Lac, Wis.	974	124	13	481	259	132	58	20	15	484	9	0	9
		1,087	*152*	*14*	*621*	*259*	*129*	*45*	*15*	*4*	*452*	*14*	*0*	*14*
185	Marinette, Wis.	1,037	117	6	649	189	112	43	13	5	362	26	0	26
		1,101	*136*	*13*	*749*	*215*	*72*	*31*	*2*	*1*	*321*	*31*	*0*	*31*
186	Wausau, Wis.	1,148	145	7	612	304	151	41	8	0	504	30	2	32
		1,122	*144*	*12*	*664*	*306*	*98*	*30*	*2*	*3*	*439*	*28*	*1*	*29*

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TABLE 7.—*Per cent of the total number of boys and girls who are of normal age,*[1] *over the normal age, and under the normal age of pupils in their respective grades in certain cities of 25,000 population and over.*

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 years.	4 years and more.	Total.	Total.
1	Birmingham, Ala	33.8	27.2	17.8	10.6	10.3	65.9	0.3
		34.8	*28.3*	*17.6*	*9.6*	*9.5*	*65.0*	*.2*
2	Mobile, Ala	44.9	22.0	13.2	8.4	8.2	51.8	3.3
		50.0	*19.2*	*10.2*	*7.2*	*8.3*	*44.9*	*5.1*
3	Montgomery, Ala	44.5	21.6	15.3	9.3	8.5	54.7	.8
		45.8	*22.5*	*12.3*	*10.4*	*8.5*	*53.7*	*.5*
4	Little Rock, Ark	45.2	20.9	12.2	6.8	11.2	51.1	3.7
		46.3	*21.3*	*10.5*	*5.4*	*12.1*	*49.3*	*4.4*
5	Los Angeles, Cal	56.5	22.7	11.9	4.4	2.6	41.6	1.9
		62.8	*21.0*	*9.3*	*3.1*	*1.4*	*34.8*	*1.4*
6	Pueblo (sch. dist. No. 20), Colo.	56.7	23.0	11.3	5.0	1.8	41.1	2.2
		60.7	*21.6*	*9.6*	*3.6*	*1.4*	*36.2*	*3.1*
7	Pueblo, Colo	58.3	21.7	11.1	4.6	1.7	39.1	2.6
		60.8	*21.8*	*8.8*	*4.5*	*2.1*	*37.2*	*2.0*
8	Bridgeport, Conn	44.3	21.8	14.3	7.4	4.2	47.7	8.0
		43.9	*21.8*	*14.5*	*7.3*	*4.2*	*47.8*	*8.3*
9	New Haven, Conn	57.0	15.0	7.5	3.1	1.9	27.8	15.2
		57.7	*15.4*	*7.2*	*3.0*	*1.4*	*27.0*	*15.3*
10	Meriden, Conn	65.2	12.4	4.3	1.0	.8	18.5	16.3
		64.5	*10.8*	*3.0*	*1.6*	*.6*	*16.0*	*19.5*
11	Waterbury, Conn	55.1	15.0	7.7	3.7	2.5	28.9	16.0
		55.4	*15.3*	*6.6*	*2.8*	*2.0*	*26.7*	*17.9*
12	(a) Savannah, Ga	50.3	23.2	14.1	5.9	5.1	48.3	1.4
		50.7	*24.1*	*15.2*	*6.0*	*2.7*	*48.0*	*1.3*
	(b) Savannah, Ga. (colored)	25.6	24.3	20.5	14.8	14.1	73.7	.7
		25.8	*24.4*	*20.7*	*14.2*	*14.0*	*73.3*	*.9*
13	Aurora, Ill	73.7	12.1	5.0	2.2	1.1	20.4	5.9
		76.1	*11.7*	*1.9*	*2.0*	*.9*	*16.5*	*7.4*
14	Aurora (West Side), Ill	69.4	17.3	9.4	1.5	1.2	29.4	1.2
		70.9	*14.6*	*4.4*	*1.7*	*1.0*	*21.7*	*7.4*
15	Chicago, Ill	61.7	19.9	9.7	3.8	2.2	35.6	2.7
		66.8	*18.1*	*7.6*	*2.7*	*1.4*	*29.8*	*3.4*
16	Danville, Ill	53.5	24.5	12.2	5.7	3.4	45.8	.7
		60.4	*21.6*	*10.2*	*4.3*	*2.2*	*38.3*	*1.3*
17	Decatur, Ill	54.9	23.6	12.3	5.7	1.9	43.5	1.6
		60.4	*21.3*	*11.4*	*4.4*	*1.7*	*38.8*	*.8*
18	Joliet, Ill	65.3	19.2	8.9	2.7	1.4	31.5	3.2
		70.7	*17.1*	*6.4*	*1.6*	*.2*	*25.3*	*4.0*
19	Quincy, Ill	51.0	21.8	13.0	5.6	3.4	43.8	5.2
		59.7	*19.4*	*9.9*	*4.2*	*1.6*	*35.1*	*5.2*
20	Rockford, Ill	60.9	22.3	8.8	3.4	1.7	36.2	2.9
		65.5	*19.2*	*9.6*	*2.1*	*.7*	*31.6*	*2.9*
21	Springfield, Ill	63.5	18.8	9.5	4.3	1.9	34.5	2.0
		67.4	*19.2*	*8.0*	*2.5*	*.9*	*30.6*	*2.0*
22	Anderson, Ind	50.0	27.6	13.3	5.8	3.0	49.7	.3
		56.5	*24.5*	*11.0*	*5.3*	*1.6*	*42.7*	*.8*
23	Fort Wayne, Ind	67.7	18.4	6.6	2.2	.7	27.9	4.4
		73.6	*14.5*	*5.9*	*1.2*	*.3*	*21.9*	*4.5*
24	Indianapolis, Ind	63.5	20.0	9.5	2.3	2.1	33.9	2.6
		65.9	*18.2*	*8.7*	*2.9*	*1.0*	*30.8*	*3.3*
25	Marion, Ind	70.0	18.4	6.4	2.1	1.1	28.0	2.0
		74.5	*15.7*	*4.7*	*2.1*	*.3*	*22.8*	*2.7*
26	Muncie, Ind	58.7	21.3	12.2	5.0	2.4	40.9	.4
		64.1	*21.9*	*8.5*	*3.6*	*1.1*	*35.1*	*.8*
27	Terre Haute, Ind	57.8	21.9	11.7	4.8	2.2	40.6	1.6
		64.4	*20.3*	*8.5*	*3.7*	*1.3*	*33.8*	*1.8*
28	Burlington, Iowa	55.6	22.1	10.9	4.5	1.9	39.4	5.0
		63.0	*20.5*	*8.3*	*2.0*	*.7*	*31.5*	*5.5*
29	Council Bluffs, Iowa	54.6	19.5	12.1	5.2	3.9	40.7	4.7
		58.7	*21.2*	*11.0*	*4.5*	*2.0*	*38.7*	*2.6*
30	Des Moines, Iowa	55.3	22.9	12.5	5.0	2.0	42.4	2.3
		62.4	*21.2*	*9.4*	*3.1*	*1.7*	*35.4*	*2.2*
31	Dubuque, Iowa	61.4	19.7	10.8	5.1	1.6	37.2	1.4
		68.1	*19.8*	*7.8*	*1.5*	*0.8*	*29.9*	*2.0*
32	Kansas City, Kans	46.3	25.7	15.9	7.4	4.1	53.1	.6
		50.1	*26.9*	*12.8*	*6.2*	*3.0*	*48.9*	*1.0*
33	Topeka, Kans	58.0	21.4	10.7	5.4	2.6	40.1	1.9
		65.1	*20.6*	*8.1*	*3.0*	*1.3*	*33.0*	*1.9*
34	Wichita, Kans	51.3	23.1	13.3	6.9	4.0	47.3	1.4
		60.2	*21.7*	*10.4*	*4.7*	*2.0*	*38.8*	*1.0*
35	Covington, Ky	56.0	21.1	11.5	6.1	3.1	41.8	2.2
		62.8	*18.3*	*11.2*	*4.4*	*1.4*	*35.3*	*1.9*

[1] For definition of normal age see footnote, page 12.

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TABLE 7.—*Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades in certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 years.	4 years and more.	Total.	Total.
36	Louisville, Ky	54.7	20.8	11.7	6.0	4.4	42.9	2.4
		61.1	*17.9*	*9.3*	*4.9*	*3.3*	*35.4*	*3.5*
37	Lewiston, Me	55.0	16.0	8.8	5.6	5.3	35.7	9.3
		54.7	*17.0*	*8.8*	*3.5*	*4.9*	*34.2*	*11.1*
38	Brockton, Mass	55.9	8.5	3.1	1.1	.3	13.0	31.1
		55.2	*5.9*	*1.9*	*.6*	*.3*	*8.7*	*36.1*
39	Everett, Mass	55.9	8.5	3.2	.7	.4	12.8	31.3
		53.5	*7.5*	*2.6*	*.5*	*.2*	*10.8*	*35.7*
40	Fall River, Mass	47.9	12.9	7.7	4.8	4.5	29.9	22.0
		48.5	*11.4*	*6.9*	*4.1*	*4.4*	*26.8*	*24.7*
41	Fitchburg, Mass	67.7	13.3	3.8	1.4	1.5	20.0	12.3
		71.3	*11.1*	*2.5*	*1.4*	*1.0*	*16.0*	*12.7*
42	Haverhill, Mass	52.0	7 8	3.3	.9	.3	12.3	35.7
		49.3	*7.1*	*2.6*	*1.0*	*.6*	*11.3*	*39.4*
43	Holyoke, Mass	51.5	10.[illegible]	4.4	2.2	1.6	18.6	29.9
		49.2	*9.[illegible]*	*4.5*	*2.5*	*1.1*	*17.3*	*33.5*
44	Lowell, Mass	54.4	12.4	6.5	2.9	1.9	23.7	21.9
		55.1	*11.2*	*5.0*	*2.1*	*1.5*	*19.8*	*25.1*
45	Malden, Mass	60.1	12.8	5.2	1.7	.6	20.3	19.6
		62.6	*11.3*	*4.1*	*1.1*	*.4*	*16.9*	*20.5*
46	New Bedford, Mass	56.9	14.8	7.9	4.5	3.4	30.6	12.5
		53.3	*11.3*	*6.2*	*3.0*	*2.0*	*22.5*	*24.2*
47	Newton, Mass	60.2	9.9	3.2	1.1	.5	14.7	25.1
		59.2	*9.1*	*2.7*	*1.1*	*.3*	*13.2*	*27.6*
48	Pittsfield, Mass	58.8	12.1	5.5	2.2	.9	20.7	20.5
		58.6	*10.6*	*3.5*	*1.3*	*.6*	*16.0*	*25.4*
49	Quincy, Mass	55.5	9.4	4.5	1.5	.6	16.0	28.5
		56.2	*9.4*	*4.1*	*1.1*	*.2*	*14.8*	*29.0*
50	Somerville, Mass	52.7	8.0	3.1	.8	.3	12.2	35.1
		51.3	*7.3*	*1.9*	*.4*	*.3*	*9.9*	*38.8*
51	Taunton, Mass	54.5	12.1	6.7	3.0	2.6	24.4	21.1
		51.8	*11.8*	*5.3*	*2.1*	*1.7*	*20.9*	*27.3*
52	Waltham, Mass	59.3	8.6	2.3	1.0	.5	12.4	28.3
		52.8	*6.6*	*2.5*	*.9*	*.1*	*10.1*	*37.1*
53	Worcester, Mass	60.9	12.2	5.2	1.7	.7	19.8	19.3
		61.2	*10.1*	*4.1*	*1.5*	*.6*	*16.3*	*22.5*
54	Battle Creek, Mich	38.5	27.2	20.3	8.4	5.3	61.2	.3
		44.3	*27.2*	*17.2*	*7.0*	*3.8*	*55.2*	*.5*
55	Bay City, Mich	50.2	20.6	11.4	6.3	4.2	42.5	7.3
		54.8	*23.2*	*10.7*	*4.4*	*2.1*	*40.4*	*4.8*
56	Calumet, Mich	60.3	18.9	9.6	5.2	2.1	35.8	3.9
		66.1	*17.5*	*8.3*	*2.1*	*.9*	*28.8*	*5.1*
57	Detroit, Mich	60.0	21.0	10.7	4.0	1.9	37.6	2.4
		64.5	*19.8*	*9.0*	*3.2*	*1.1*	*33.1*	*2.4*
58	Grand Rapids, Mich	39.3	30.3	18.4	7.4	3.9	60.0	.7
		45.9	*30.7*	*16.2*	*5.8*	*2.6*	*55.3*	*.8*
59	Kalamazoo, Mich	65.8	18.1	8.8	3.5	1.4	31.8	2.4
		71.2	*17.4*	*5.6*	*1.9*	*.5*	*25.4*	*3.4*
60	Saginaw, Mich	65.2	15.4	9.1	3.4	1.0	28.9	5.9
		70.6	*12.9*	*6.1*	*1.8*	*.7*	*21.5*	*7.9*
61	Saginaw (West Side), Mich	63.9	16.5	8.2	3.2	.8	28.7	7.4
		67.8	*14.2*	*4.6*	*2.3*	*.6*	*21.7*	*10.5*
62	Duluth, Minn	59.5	22.3	11.0	3.5	1.6	38.4	2.1
		64.5	*20.7*	*7.7*	*2.5*	*1.3*	*32.2*	*3.3*
63	Minneapolis, Minn	55.0	24.3	12.6	4.8	2.3	44.0	1.0
		60.8	*22.9*	*10.2*	*3.4*	*1.4*	*37.9*	*1.3*
64	St. Joseph, Mo	58.8	19.2	10.9	5.1	3.0	38.2	3.0
		63.5	*19.0*	*9.2*	*3.5*	*1.5*	*33.2*	*3.3*
65	St. Louis, Mo	41.1	31.1	16.5	7.0	3.8	58.4	.5
		45.5	*31.2*	*14.5*	*5.7*	*2.6*	*54.0*	*.5*
66	Butte, Mont	60.0	20.8	10.0	5.0	2.0	37.8	2.2
		66.6	*17.9*	*7.6*	*2.5*	*1.1*	*29.1*	*4.3*
67	East Orange, N. J	54.4	20.6	11.8	5.9	2.1	40.4	5.2
		57.7	*20.9*	*11.5*	*3.7*	*1.6*	*37.7*	*4.6*
68	Hoboken, N. J	53.7	23.0	12.7	4.6	2.5	42.8	3.5
		57.5	*21.4*	*10.4*	*4.0*	*12.1*	*37.9*	*4.6*
69	New Brunswick, N. J	50.5	19.2	8.8	4.9	2.3	35.2	14.3
		54.5	*14.2*	*7.5*	*2.8*	*1.7*	*26.2*	*19.3*
70	Orange, N. J	50.4	22.4	13.5	7.7	4.1	47.7	1.9
		46.9	*27.2*	*12.4*	*6.3*	*4.0*	*49.9*	*3.2*
71	Paterson, N. J	58.6	18.4	8.8	3.7	1.5	32.4	9.0
		62.5	*16.6*	*6.9*	*2.4*	*1.1*	*27.0*	*10.5*

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TABLE 7.—*Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades in certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 years.	4 years and more.	Total.	Total.
72	Passaic, N. J.	52.7	22.3	12.5	6.8	3.4	45.0	2.3
		56.6	*20.6*	*11.0*	*5.4*	*3.4*	*40.4*	*3.0*
73	Perth Amboy, N. J.	49.2	21.4	12.2	5.0	2.8	41.4	9.4
		54.9	*20.5*	*9.6*	*2.7*	*1.2*	*34.0*	*11.1*
74	Trenton, N. J.	50.9	21.0	11.8	4.8	3.3	40.9	8.2
		57.7	*18.7*	*8.5*	*3.4*	*1.5*	*32.1*	*10.2*
75	Albany, N. Y.	56.8	17.7	10.0	3.8	1.6	33.1	10.1
		60.0	*17.2*	*7.4*	*2.7*	*.8*	*28.1*	*11.9*
76	Auburn, N. Y.	59.3	17.8	8.9	3.1	1.5	3.3	9.4
		61.7	*14.7*	*8.4*	*2.7*	*1.3*	*27.1*	*11.2*
77	Elmira, N. Y.	54.3	19.6	11.5	4.9	2.8	38.8	6.9
		56.7	*19.5*	*9.0*	*3.9*	*2.1*	*34.5*	*8.8*
78	Jamestown, N. Y.	64.3	17.6	7.6	3.1	.7	29.0	6.7
		68.6	*15.7*	*5.3*	*2.3*	*.7*	*24.0*	*7.4*
79	Kingston, N. Y.	49.2	21.5	12.3	5.9	4.4	44.1	6.7
		52.2	*19.8*	*10.9*	*4.8*	*3.0*	*38.5*	*9.3*
80	Newburgh, N. Y.	53.1	17.6	11.0	4.8	2.1	35.5	11.4
		54.7	*16.9*	*7.8*	*4.4*	*2.2*	*31.3*	*14.0*
81	Niagara Falls, N. Y.	56.7	19.3	10.0	5.3	2.4	37.0	6.3
		63.5	*17.5*	*7.8*	*3.5*	*1.3*	*30.1*	*6.4*
82	Poughkeepsie, N. Y.	57.0	16.1	8.8	4.5	3.0	32.4	10.6
		59.8	*17.5*	*7.4*	*2.5*	*1.3*	*28.7*	*11.5*
83	Rochester, N. Y.	55.4	17.5	8.2	2.7	1.8	30.3	14.4
		69.7	*15.2*	*5.4*	*1.9*	*1.1*	*23.6*	*6.7*
84	Schenectady, N. Y.	51.7	21.3	13.1	6.6	4.6	45.6	2.7
		54.4	*20.4*	*13.2*	*6.3*	*3.0*	*42.9*	*2.7*
85	Syracuse, N. Y.	58.5	18.5	9.4	3.4	1.8	33.1	8.4
		61.2	*17.0*	*8.9*	*2.7*	*1.0*	*29.6*	*9.2*
86	Troy, N. Y.	48.4	20.4	11.5	7.3	4.1	43.3	8.3
		53.1	*21.8*	*11.0*	*4.3*	*1.8*	*38.9*	*8.0*
87	Utica, N. Y.	59.7	19.0	10.8	4.0	3.4	37.2	3.1
		64.2	*18.3*	*7.9*	*2.4*	*2.4*	*31.0*	*4.8*
88	Watertown, N. Y.	48.3	21.7	14.1	6.6	3.9	46.3	5.4
		51.3	*22.4*	*13.6*	*5.3*	*2.8*	*44.1*	*4.6*
89	Yonkers, N. Y.	46.9	21.3	13.6	5.7	4.0	44.6	8.5
		53.3	*20.3*	*10.3*	*4.8*	*3.2*	*38.6*	*8.1*
90	Akron, Ohio	62.2	11.9	5.6	1.9	.9	20.3	17.5
		64.3	*11.6*	*3.5*	*1.0*	*.6*	*16.7*	*19.0*
91	Canton, Ohio	58.3	18.9	11.1	5.7	2.5	38.2	3.5
		65.0	19.6	*7.9*	*3.0*	*1.0*	*31.5*	*3.5*
92	Columbus, Ohio	58.6	20.5	10.7	5.0	3.0	39.2	2.2
		63.7	*18.6*	*9.4*	*3.7*	*2.0*	*33.7*	*2.6*
93	Dayton, Ohio	62.5	19.8	9.9	4.0	2.0	35.7	1.8
		68.1	*18.8*	*7.8*	*2.6*	*1.1*	*30.3*	*1.6*
94	Hamilton, Ohio	57.4	20.3	12.2	6.1	2.8	41.4	1.2
		63.3	*20.3*	*9.7*	*3.7*	*2.0*	*35.7*	*1.0*
95	Springfield, Ohio	62.8	17.7	9.4	4.1	1.8	32.4	4.8
		57.8	*16.0*	*7.6*	*2.6*	*.8*	*27.0*	*5.2*
96	Toledo, Ohio	60.3	18.8	10.4	4.2	2.7	36.1	3.6
		67.0	*16.8*	*8.4*	*2.7*	*.9*	*28.8*	*4.2*
97	Youngstown, Ohio	51.5	23.8	13.8	6.5	3.3	47.4	1.1
		58.0	*22.8*	*12.2*	*4.0*	*2.0*	*41.0*	*1.0*
98	Allentown, Pa.	71.0	14.0	5.5	1.8	1.1	22.4	6.6
		72.1	*14.0*	*4.5*	*1.3*	*.4*	*20.2*	*7.7*
99	Altoona, Pa.	55.5	20.9	12.4	5.1	2.5	40.9	3.6
		60.5	*20.3*	*10.1*	*3.3*	*1.5*	*35.2*	*4.3*
100	Easton, Pa.	59.0	19.9	11.0	4.6	2.0	37.9	3.1
		62.4	*20.1*	*10.2*	*3.2*	*1.5*	*35.0*	*2.6*
101	Erie, Pa.	38.9	23.3	17.6	11.9	7.8	60.6	.5
		46.3	*24.9*	*16.0*	*7.9*	*3.8*	*52.6*	*1.1*
102	Harrisburg, Pa.	61.1	18.9	8.7	3.8	2.4	33.8	5.1
		65.3	*17.6*	*7.1*	*2.3*	*1.4*	*28.4*	*6.3*
103	Lancaster, Pa.	67.1	15.6	6.0	2.8	1.3	25.7	7.2
		72.1	*14.3*	*4.7*	*1.5*	*.8*	*21.3*	*6.6*
104	Newcastle, Pa.	60.6	19.2	12.6	4.5	1.4	37.7	1.7
		68.7	*16.4*	*9.0*	*2.3*	*.6*	*28.3*	*3.0*
105	Norristown, Pa.	64.8	17.3	7.8	4.4	3.2	32.7	2.5
		72.0	*13.5*	*7.1*	*3.4*	*1.5*	*25.5*	*2.5*
106	Philadelphia, Pa.	53.6	21.9	12.5	6.2	3.6	44.2	2.2
		57.2	*21.1*	*11.7*	*5.0*	*2.5*	*40.3*	*2.5*
107	Pittsburg	49.2	22.2	13.8	7.0	4.4	47.4	3.4
		53.5	*22.7*	*12.4*	*5.1*	*2.1*	*42.3*	*4.2*

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TABLE 7.—*Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades, in certain cities of 25,000 population and over*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 years.	4 years and more.	Total.	Total.
108	Reading, Pa	60.1	19.2	10.6	3.8	1.3	34.9	5.0
		68.1	*15.9*	*6.8*	*2.2*	*.5*	*25.4*	*6.5*
109	Wilkes-Barre, Pa	71.7	16.8	5.1	1.8	.8	24.5	3.8
		74.7	*14.3*	*4.4*	*1.2*	*.9*	*20.8*	*4.5*
110	Williamsport, Pa	61.7	18.2	8.5	4.2	1.9	32.8	5.5
		64.2	*18.7*	*7.3*	*2.4*	*1.0*	*29.4*	*6.4*
111	York, Pa	67.6	17.1	6 8	3.2	.9	28.0	4.4
		70.8	*14.8*	*6.1*	*2.1*	*.7*	*23.7*	*5.5*
112	Newport, R. I	58.4	13 8	5.4	2.4	1.0	22.6	19.0
		58.2	*12.0*	*5.5*	*2.2*	*1.3*	*21.0*	*20.8*
113	Providence, R. I	63.4	18.1	9.1	4.3	2.6	34.1	2.5
		64.5	*17.3*	*8.4*	*3.5*	*2.2*	*31.4*	*4.1*
114	Warwick, R. I	52.5	14.7	8.9	4.5	4.3	32.4	15.1
		56.1	*14.3*	*6.1*	*3.6*	*2.4*	*26.4*	*17.5*
115	Woonsocket, R. I	43.8	14.2	10.3	7.1	6.4	38.0	18.2
		48.1	*13.5*	*9.0*	*6.8*	*4.8*	*34.1*	*17.8*
116	Columbia, S. C	30.1	32.1	18.5	11.7	7.6	69.9	.....
		33.1	*33.9*	*17.9*	*9.8*	*5.3*	*66.9*	.....
117	Nashville, Tenn	39.4	25.8	15.5	10.2	8.6	60.1	.5
		42.6	*25.6*	*14.7*	*8.9*	*7.6*	*56.8*	*.6*
118	Dallas, Tex	40.2	29.1	17.6	7.7	4.7	59.1	.7
		43.0	*29.5*	*17.3*	*6.6*	*3.1*	*56.5*	*.5*
119	Galveston, Tex	38.4	25.8	17.9	11.1	6.5	61.3	.3
		42.4	*27.3*	*16.3*	*9.1*	*4.5*	*57.2*	*.4*
120	Houston, Tex	25.8	27.9	21.8	13.2	11.0	73.9	.3
		30.5	*27.4*	*19.3*	*12.3*	*10.2*	*69.2*	*.3*
121	*San Antonio, Tex	30.8	26.9	19.8	10.8	11.4	68.9	.3
		34.5	*28.7*	*17.9*	*9.8*	*8.7*	*65.1*	*.4*
122	Salt Lake City, Utah	44.6	21.3	15 6	10.7	6.5	54.1	1.3
		57.8	*23.0*	*12.2*	*4.2*	*1.1*	*40.5*	*1.7*
123	Lynchburg, Va	32.8	26.3	17.7	12.7	10.2	66.9	.3
		31.0	*27.3*	*19.3*	*12.4*	*9.8*	*68.8*	*.2*
124	Seattle, Wash	49.4	25.7	14.4	5.9	3.4	49.4	1.2
		53.3	*26.5*	*12.6*	*4.5*	*1.6*	*45.2*	*1.5*
125	Spokane, Wash	54.3	22.7	12.7	6.4	2.5	44.3	1.4
		57.7	*23.2*	*11.2*	*4.6*	*1.5*	*40.5*	*1.8*
126	Takoma, Wash	62.5	21.2	9.4	3.8	1.0	35.4	2.1
		67.3	*20.7*	*7.3*	*2.1*	*.7*	*30.8*	*1.9*
127	Green Bay, Wis	57.3	14.6	6.8	3.2	1.6	26.2	16.5
		62.2	*11.1*	*4.1*	*1.4*	*1.5*	*18.1*	*19.7*
128	La Crosse, Wis	49.0	21.5	13.5	7.1	2.8	44.9	6.1
		55.5	*22.4*	*11.1*	*3.2*	*.3*	*37.0*	*7.5*
129	Madison, Wis	59.6	17.5	10.3	3.5	2.0	33.3	7.1
		64.6	*16.2*	*7.2*	*2.0*	*.8*	*26.2*	*9.2*
130	Racine, Wis	69.8	13.9	6.1	2.1	1.3	23.4	6.8
		75.0	*11.2*	*3.9*	*1.4*	*.7*	*17.2*	*7.8*
131	Sheboygan, Wis	70.3	15.8	6.2	2.3	.9	25.2	4.5
		77.0	*12.0*	*4.2*	*1.4*	*.4*	*18.0*	*5.0*
132	Superior, Wis	63.0	19.3	9.3	2.5	1.2	32.3	4.7
		69.0	*16.8*	*5.7*	*2.1*	*1.0*	*25.7*	*5.3*

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TABLE 8.—*Per cent of the total number of boys and girls who are of normal age,*[1] *over the normal age, and under the normal age of pupils in their respective grades in certain cities having less than 25,000 population.*

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 years.	4 years or more.	Total.	
1	Fort Smith, Ark	56.4	18.0	12.3	5.7	5.5	41.5	2.1
		58.9	*17.3*	*11.0*	*5.9*	*3.9*	*38.1*	*3.0*
2	Hot Springs, Ark	44.2	19.8	14.6	10.8	9.9	55.1	.7
		40.9	*24.4*	*17.4*	*9.6*	*6.5*	*57.9*	*1.2*
3	Alameda, Cal	51.3	25.6	13.8	4.6	3.2	47.2	1.5
		55.9	*24.5*	*12.1*	*3.4*	*2.0*	*42.0*	*2.1*
4	Fresno, Cal	45.7	23.8	14.4	7.8	7.4	53.4	.9
		54.0	*22.2*	*12.1*	*5.6*	*4.6*	*44.5*	*1.5*
5	Pasadena, Cal	53.6	22.1	13.2	6.1	2.4	43.8	2.6
		61.7	*20.4*	*9.9*	*3.6*	*1.1*	*35.0*	*3.3*
6	Riverside, Cal	60.2	18.7	11.8	4.0	2.5	37.0	2.8
		67.9	*16.1*	*6.8*	*3.4*	*1.4*	*27.7*	*4.4*
7	Santa Barbara, Cal	47.0	28.4	13.5	6.2	2.9	51.0	2.0
		56.8	*24.3*	*9.7*	*4.5*	*2.9*	*41.4*	*1.8*
8	Santa Cruz, Cal	54.5	24.9	13.0	5.0	2.3	45.2	.3
		60.2	*25.1*	*10.2*	*1.7*	*1.6*	*38.6*	*1.2*
9	Stockton, Cal	57.1	20.3	11.6	5.0	2.1	39.0	3.9
		65.4	*18.5*	*9.0*	*2.6*	*.6*	*30.7*	*3.9*
10	Vallejo, Cal	55.1	22.9	11.5	5.5	1.5	41.4	3.5
		61.5	*22.1*	*10.0*	*3.2*	*.6*	*35.9*	*2.6*
11	Canon City, Colo	55.6	23.4	12.0	4.0	4.0	43.4	1.0
		58.5	*23.2*	*8.0*	*7.3*	*2.0*	*40.5*	*1.0*
12	Grand Junction, Colo	50.6	23.4	12.9	6.8	5.3	48.4	1.0
		58.3	*19.0*	*12.1*	*5.6*	*4.0*	*40.7*	*1.0*
13	Ansonia, Conn	57.0	13.8	8.1	3.4	.9	26.2	6.8
		58.1	*13.0*	*5.5*	*1.5*	*.5*	*20.5*	*21.4*
14	Danbury, Conn	52.3	19.5	8.9	4.2	2.3	34.9	12.8
		58.1	*18.0*	*8.4*	*2.7*	*1.6*	*30.7*	*13.2*
15	Middletown, Conn	54.8	13.0	6.8	3.4	4.4	27.6	17.6
		54.8	*14.2*	*6.6*	*3.3*	*2.1*	*26.2*	*19.0*
16	Naugatuck, Conn	61.5	17.6	6.8	2.6	1.4	28.4	10.1
		59.8	*15.3*	*6.4*	*2.0*	*1.2*	*24.9*	*15.3*
17	Torrington, Conn	52.6	16.0	6.0	2.5	2.2	26.7	20.7
		56.6	*11.5*	*4.6*	*1.3*	*.8*	*18.2*	*25.2*
18	Wallingford, Conn	49.4	10.7	6.1	2.8	.9	20.5	30.1
		50.7	*9.8*	*2.5*	*2.4*	*.1*	*14.8*	*34.5*
19	Pensacola, Fla	42.6	19.5	15.8	10.2	10.2	55.7	1.7
		44.2	*18.9*	*14.7*	*9.7*	*10.5*	*53.8*	*2.0*
20	Athens, Ga	54.3	16.5	11.1	7.3	7.8	42.7	3.0
		51.4	*22.6*	*11.5*	*6.0*	*5.5*	*45.6*	*3.0*
21	Columbus, Ga	41.1	24.6	16.7	9.8	7.3	58.4	.5
		41.0	*24.7*	*15.8*	*10.2*	*7.8*	*58.5*	*.5*
22	Dalton, Ga	37.1	23.6	15.5	12.4	10.8	62.3	.6
		42.0	*23.0*	*17.6*	*9.2*	*7.6*	*57.4*	*.6*
23	Lagrange, Ga	45.2	19.6	14.5	8.9	10.1	53.1	1.7
		52.4	*17.4*	*12.8*	*6.8*	*8.6*	*45.6*	*2.0*
24	Pocatello, Idaho	58.2	18.3	12.3	5.5	2.6	38.7	3.1
		61.6	*21.2*	*10.0*	*2.8*	*1.8*	*35.8*	*2.6*
25	Alton, Ill	64.0	19.7	8.9	3.5	1.9	34.0	2.0
		66.9	*17.2*	*9.9*	*3.7*	*1.3*	*31.1*	*2.0*
26	Belleville, Ill	67.7	18.8	8.4	2.8	1.6	31.6	.7
		77.8	*15.6*	*4.2*	*1.7*	*.4*	*21.9*	*.3*
27	Canton, Ill	52.5	21.5	14.5	6.7	2.8	45.5	2.0
		64.4	*20.1*	*8.9*	*3.8*	*1.0*	*33.8*	*1.8*
28	Centralia, Ill	61.8	20.0	11.1	3.9	2.2	37.2	1.0
		66.6	*18.8*	*8.2*	*3.7*	*1.2*	*31.9*	*1.5*
29	Champaign, Ill	64.1	16.1	11.3	3.2	1.0	31.6	4.3
		69.1	*15.4*	*8.4*	*2.2*	*.9*	*26.9*	*4.0*
30	Chicago Heights, Ill	54.0	21.8	13.1	5.3	4.2	44.4	1.6
		58.4	*23.7*	*11.6*	*3.9*	*1.5*	*40.7*	*.9*
31	Clinton, Ill	64.4	17.1	11.0	4.2	2.7	35.0	.6
		67.2	*19.9*	*8.6*	*2.4*	*.4*	*31.3*	*1.5*
32	De Kalb, Ill	67.1	21.9	4.5	2.1	1.4	29.9	3.0
		75.6	*14.0*	*4.1*	*.5*	*.3*	*18.9*	*5.5*
33	Evanston (Dist. No. 76), Ill	64.5	20.3	10.6	2.1	.6	33.6	1.9
		70.8	*17.9*	*8.0*	*2.4*	*.5*	*28.8*	*.4*
34	Evanston (Dist. No. 75), Ill	65.7	18.2	8.4	3.8	1.9	32.3	2.0
		69.9	*16.2*	*8.8*	*2.5*	*1.1*	*28.6*	*1.9*
35	Freeport, Ill	36.5	32.8	17.9	9.1	3.7	63.5	.0
		41.4	*32.4*	*18.4*	*5.6*	*2.2*	*58.6*	*.0*
36	Galesburg, Ill	66.5	19.9	6.6	2.5	1.4	30.4	3.1
		71.9	*16.9*	*5.5*	*2.0*	*.6*	*25.0*	*3.1*

[1] For definition of normal age see footnote, p. 12.

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TABLE 8.—*Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades in certain cities having less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 years.	4 years or more.	Total.	
37	Jacksonville, Ill	53.3	20.5	14.2	7.5	3.2	45.4	1.3
		59.4	*20.8*	*10.5*	*5.4*	*2.0*	*38.7*	*1.9*
38	Kankakee, Ill	61.0	17.3	9.4	4.4	1.1	32.2	6.8
		68.3	*14.6*	*5.2*	*1.4*	*0.4*	*21.6*	*10.1*
39	La Salle, Ill	89.0	7.1	3.5	0.0	0.0	10.6	.4
		89.4	*6.4*	*.2*	*0.0*	*0.0*	*6.6*	*4.0*
40	Macomb, Ill	50.1	19.9	16.0	8.1	3.4	47.4	2.5
		62.2	*17.8*	*11.8*	*3.7*	*2.5*	*35.8*	*2.0*
41	Mattoon, Ill	55.1	20.2	11.8	6.7	2.8	41.5	3.4
		63.2	*19.5*	*8.9*	*4.9*	*1.0*	*34.3*	*2.5*
42	Maywood and Melrose Park, Ill.	58.1	23.6	10.2	4.1	2.7	40.6	1.3
		65.3	*20.7*	*8.1*	*2.9*	*1.2*	*32.9*	*1.8*
43	Moline, Ill	66.3	21.4	7.4	2.2	.8	31.8	1.9
		73.4	*16.1*	*5.4*	*.8*	*.5*	*22.8*	*3.8*
44	Ottawa, Ill	74.6	15.7	6.6	1.8	.....	24.1	1.3
		76.6	*15.1*	*4.5*	*1.6*	.....	*21.2*	*2.2*
45	Pekin, Ill	61.1	20.3	11.0	4.3	2.3	37.9	1.0
		72.9	*16.0*	*7.0*	*2.6*	*.6*	*26.2*	*.9*
46	Rock Island, Ill	68.6	13.6	6.7	1.6	.4	22.3	9.1
		72.0	*12.1*	*2.9*	*.9*	*.8*	*16.7*	*11.3*
47	Streator, Ill	57.3	22.1	13.4	4.6	1.6	41.7	1.0
		59.9	*25.3*	*9.6*	*3.4*	*.8*	*39.1*	*1.0*
48	Waukegan, Ill	72.8	14.4	7.5	1.9	.9	24.7	2.5
		73.4	*14.6*	*5.5*	*1.1*	*1.0*	*22.2*	*4.4*
49	Alexandria, Ind	62.3	18.1	9.7	3.7	.6	32.1	5.6
		68.3	*16.7*	*7.5*	*1.9*	*1.1*	*27.2*	*4.5*
50	Bedford, Ind	62.2	20.3	10.7	3.9	2.0	36.9	.9
		72.8	*16.0*	*6.5*	*2.1*	*.8*	*25.4*	*1.8*
51	Connersville, Ind	63.6	17.9	10.1	4.3	2.4	34.7	1.7
		71.7	*16.6*	*7.1*	*2.1*	*1.0*	*26.8*	*1.5*
52	Crawfordsville, Ind	61.0	19.9	7.5	7.3	1.7	36.4	2.6
		67.4	*16.2*	*7.5*	*2.6*	*.5*	*26.8*	*5.8*
53	East Chicago, Ind	59.3	20.8	9.8	3.6	1.9	36.1	4.6
		58.5	*21.5*	*9.5*	*3.0*	*1.9*	*35.9*	*5.6*
54	Frankfort, Ind	65.1	18.6	9.6	2.9	1.8	32.9	2.0
		67.6	*18.7*	*8.5*	*2.3*	*.5*	*30.0*	*2.4*
55	Goshen, Ind	55.1	21.9	11.8	4.3	2.7	40.7	4.2
		61.4	*13.6*	*6.4*	*1.9*	*.7*	*22.6*	*16.0*
56	Kokomo, Ind	62.3	19.6	11.5	3.9	1.7	36.7	1.0
		71.1	*16.9*	*6.6*	*2.7*	*.6*	*26.8*	*2.1*
57	La Porte, Ind	62.0	22.1	8.0	3.0	3.0	36.1	1.9
		68.9	*17.6*	*8.5*	*2.3*	*.2*	*28.6*	*2.5*
58	Lebanon, Ind	52.1	24.1	14.6	7.1	1.3	47.1	.8
		65.0	*20.2*	*10.8*	*2.6*	*.5*	*34.1*	*.9*
59	Logansport, Ind	55.7	25.9	12.5	3.4	1.4	43.2	1.1
		63.2	*21.5*	*10.0*	*2.4*	*1.2*	*35.1*	*1.7*
60	Michigan City, Ind	60.1	22.1	12.2	3.8	.9	39.0	.9
		69.1	*19.8*	*6.3*	*2.6*	*.5*	*29.2*	*1.7*
61	Peru, Ind	61.8	20.7	7.9	2.6	1.1	32.3	5.9
		67.0	*19.6*	*6.1*	*1.6*	*.4*	*27.7*	*5.3*
62	Wabash, Ind	73.6	14.4	7.6	1.9	.1	24.0	2.4
		81.8	*11.5*	*2.5*	*.1*	*.1*	*14.2*	*4.0*
63	Clinton, Iowa	48.9	27.9	14.7	5.5	2.3	50.4	.7
		54.1	*27.6*	*11.1*	*4.1*	*1.4*	*44.2*	*1.7*
64	Creston, Iowa	63.8	13.7	7.2	2.7	1.0	24.6	11.6
		69.1	*11.7*	*4.1*	*1.1*	*.4*	*17.3*	*13.6*
65	Iowa City, Iowa	66.3	15.8	5.0	2.4	1.7	24.9	8.8
		70.0	*11.4*	*7.0*	*1.4*	*.2*	*20.0*	*10.0*
66	Keokuk, Iowa	55.7	17.3	9.6	4.6	2.8	34.3	10.0
		65.9	*15.0*	*6.0*	*2.0*	*2.0*	*25.0*	*9.1*
67	Marshalltown, Iowa	52.0	24.1	14.2	6.0	2.5	46.8	1.2
		59.4	*19.3*	*11.8*	*5.0*	*2.7*	*38.8*	*1.8*
68	Mason City, Iowa	57.5	21.8	10.4	3.5	2.6	38.3	4.2
		68.6	*19.0*	*8.2*	*1.3*	.....	*28.5*	*2.9*
69	Muscatine, Iowa	59.5	16.4	5.7	3.0	1.7	26.8	13.7
		65.1	*8.9*	*3.3*	*1.5*	*.5*	*14.2*	*20.7*
70	Oskaloosa, Iowa	56.6	23.4	11.8	4.5	1.5	41.2	2.2
		58.6	*21.3*	*11.3*	*4.0*	*2.3*	*38.9*	*2.5*
71	Ottumwa, Iowa	57.3	17.8	10.3	3.3	1.3	32.7	10.0
		61.3	*15.9*	*7.4*	*2.0*	*1.2*	*26.5*	*12.2*
72	Arkansas City, Kans	54.3	19.6	13.3	8.0	4.3	45.2	.5
		61.1	*20.0*	*8.2*	*6.3*	*2.4*	*36.9*	*2.0*
73	Emporia, Kans	40.9	26.0	17.6	9.4	6.1	59.1	.0
		50.0	*21.9*	*14.4*	*5.7*	*6.8*	*48.8*	*1.2*
74	Hutchinson, Kans	57.4	23.4	11.5	5.1	2.2	42.2	.4
		61.6	*21.4*	*10.0*	*4.8*	*1.3*	*37.5*	*.9*

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TABLE 8.—*Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades in certain cities having less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 years.	4 years or more.	Total.	
75	Parsons, Kans	51.5	25.3	13.8	6.8	2.2	48.1	0.4
		56.5	*26.7*	*9.4*	*4.4*	*2.2*	*42.7*	*.8*
76	Owensboro, Ky	59.6	21.6	9.6	4.6	3.7	39.5	.9
		65.5	*12.9*	*7.9*	*4.2*	*2.1*	*31.2*	*3.3*
77	Shreveport, La	36.0	26.9	20.9	9.2	6.2	63.5	.5
		41.0	*30.0*	*17.9*	*6.6*	*3.6*	*58.1*	*.9*
78	Bangor, Me	60.5	16.6	5.4	2.8	.8	25.6	13.9
		54.8	*12.9*	*5.7*	*4.5*	*.8*	*23.9*	*21.3*
79	Waterville, Me	57.3	18.2	9.6	5.0	2.1	34.9	7.8
		61.3	*16.1*	*6.6*	*3.4*	*.9*	*27.0*	*11.7*
80	Cumberland, Md	36.8	23.3	19.6	11.2	8.7	62.8	.4
		41.9	*27.7*	*17.7*	*8.5*	*3.9*	*57.8*	*.3*
81	Hagerstown, Md	36.5	26.6	19.4	12.1	5.1	63.2	.3
		43.7	*27.3*	*16.0*	*8.0*	*4.4*	*55.7*	*.6*
82	Adams, Mass	57.9	9.8	3.6	2.1	1.7	17.2	24.9
		57.6	*8.7*	*2.8*	*1.4*	*1.1*	*14.0*	*28.4*
83	Attleboro, Mass	56.0	15.6	6.6	2.7	2.3	27.2	16.8
		55.3	*13.2*	*7.1*	*2.0*	*2.1*	*24.4*	*20.3*
84	Beverly, Mass	53.1	9.3	2.9	.6	.1	12.9	34.0
		54.9	*7.4*	*3.1*	*.4*	*.1*	*11.0*	*34.1*
85	Danvers, Mass	56.3	7.7	3.2	.9	.0	11.8	31.9
		45.7	*6.7*	*1.8*	*.6*	*.0*	*9.1*	*45.2*
86	Dedham, Mass	50.2	3.7	2.1	.6	.6	7.0	42.8
		39.9	*3.2*	*2.0*	*.3*	*.0*	*5.5*	*54.6*
87	Framingham, Mass	50.0	7.7	2.6	.3	.1	10.7	39.3
		52.4	*5.1*	*2.5*	*.5*	*.8*	*8.9*	*38.7*
88	Gardner, Mass	53.9	8.6	7.3	3.2	1.6	20.7	25.4
		52.2	*8.0*	*5.0*	*2.0*	*1.1*	*16.1*	*31.7*
89	Marlboro, Mass	57.6	14.2	6.3	2.4	1.5	24.4	18.0
		59.7	*13.0*	*5.0*	*1.8*	*.8*	*20.6*	*19.7*
90	Melrose, Mass	53.7	7.7	2.1	.5	.1	10.4	35.9
		49.4	*5.7*	*1.4*	*.1*	*.0*	*7.2*	*43.4*
91	Medford, Mass	44.9	5.6	2.5	.4	.1	8.6	41.5
		47.8	*5.9*	*1.1*	*.1*	*.0*	*7.1*	*45.1*
92	Milford, Mass	51.8	11.3	4.8	2.8	2.1	21.0	27.2
		49.7	*7.7*	*3.6*	*2.9*	*.9*	*15.1*	*35.2*
93	Montague, Mass	48.6	9.2	4.6	1.5	.4	15.7	35.7
		47.5	*5.1*	*1.9*	*.0*	*.4*	*7.4*	*45.1*
94	Natick, Mass	48.8	7.4	2.0	.8	.3	10.5	40.7
		50.0	*4.5*	*1.6*	*.5*	*.4*	*7.0*	*43.0*
95	Newburyport, Mass	50.4	8.2	2.3	1.3	.7	12.5	37.1
		44.7	*5.6*	*2.1*	*.8*	*.2*	*8.7*	*46.6*
96	North Attleboro, Mass	56.1	13.0	6.5	3.1	2.5	25.1	18.8
		53.4	*15.3*	*6.1*	*1.6*	*.2*	*23.2*	*23.4*
97	Norwood, Mass	55.9	7.6	3.1	.9	.1	11.7	32.4
		57.6	*6.8*	*1.1*	*.7*	*.3*	*8.9*	*33.5*
98	Northbridge, Mass	54.1	15.2	5.3	3.8	1.0	25.3	20.6
		58.6	*11.6*	*5.9*	*1.5*	*1.3*	*20.3*	*21.1*
99	Peabody, Mass	56.8	11.7	4.1	1.5	.6	17.9	25.3
		48.1	*11.2*	*4.6*	*1.7*	*.7*	*18.2*	*33.7*
100	Revere, Mass	55.8	7.8	2.9	.7	.3	11.7	32.5
		54.4	*7.3*	*1.8*	*.1*	*.4*	*9.6*	*36.0*
101	Wakefield, Mass	50.3	8.2	2.9	.7	.4	12.2	37.5
		48.7	*4.0*	*2.4*	*1.0*	*.5*	*7.9*	*43.4*
102	Westfield, Mass	60.4	17.2	5.4	3.1	.7	26.4	13.2
		65.6	*13.5*	*3.6*	*1.0*	*1.3*	*19.4*	*15.0*
103	West Springfield, Mass	65.4	14.1	6.4	1.7	.8	23.0	11.6
		68.0	*12.4*	*3.9*	*1.2*	*.3*	*17.8*	*14.2*
104	Weymouth, Mass	50.7	11.9	6.0	3.0	.2	21.1	28.2
		48.5	*12.3*	*7.1*	*3.5*	*.2*	*23.1*	*28.4*
105	Winchester (town), Mass	51.7	9.6	3.8	.5	.8	14.7	33.6
		54.1	*6.0*	*1.5*	*.7*	*.1*	*8.3*	*37.6*
106	Winthrop, Mass	56.2	7.9	2.3	.2	.....	10.4	33.4
		54.9	*6.5*	*1.0*	*.2*	.....	*7.7*	*37.4*
107	Woburn, Mass	51.5	11.6	4.7	1.4	.3	18.0	30.5
		50.4	*9.9*	*4.0*	*1.5*	*.7*	*16.1*	*33.5*
108	Ann Arbor, Mich	56.3	19.1	11.3	4.8	2.0	37.2	6.5
		66.2	*17.0*	*6.0*	*2.8*	*.5*	*26.3*	*7.5*
109	Cadillac, Mich	54.3	21.9	10.7	5.2	4.1	41.9	3.8
		62.3	*18.9*	*9.0*	*3.4*	*1.1*	*32.4*	*5.3*
110	Cheboygan, Mich	50.6	19.3	11.8	6.1	5.2	42.4	7.0
		56.0	*20.8*	*8.5*	*3.8*	*2.2*	*35.3*	*8.7*
111	Escanaba, Mich	75.6	11.7	4.6	2.0	1.0	19.3	5.1
		81.4	*9.4*	*1.3*	*1.3*	*.1*	*12.1*	*6.5*
112	Hancock, Mich	52.1	21.0	11.4	3.0	2.3	37.7	10.2
		52.8	*55.8*	*9.5*	*2.8*	*.9*	*39.0*	*8.2*

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TABLE 8.—*Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades in certain cities having less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 years.	4 years or more.	Total.	
113	Holland, Mich	68.5	19.0	7.4	2.6	0.6	29.6	1.9
		73.3	*15.7*	*5.2*	*1.8*	*.8*	*23.5*	*3.2*
114	Iron Mountain, Mich	50.2	24.7	14.1	7.3	2.5	48.6	1.2
		59.6	*24.5*	*9.6*	*3.0*	*.9*	*38.0*	*2.4*
115	Ironwood, Mich	63.6	20.0	8.7	4.2	.5	33.4	3.0
		70.4	*14.2*	*8.0*	*.6*	*.2*	*23.0*	*6.6*
116	Ishpeming, Mich	70.4	14.6	6.3	1.9	.8	23.6	6.0
		80.1	*9.3*	*3.7*	*1.3*	*.4*	*14.7*	*5.2*
117	Lansing, Mich	50.1	21.9	14.9	6.9	4.0	47.7	2.2
		57.1	*23.2*	*10.5*	*4.4*	*2.1*	*40.2*	*2.7*
118	Marquette, Mich	58.4	15.3	9.8	2.8	2.1	30.0	11.6
		65.8	*13.6*	*6.1*	*1.3*	*1.2*	*22.2*	*12.0*
119	Menominee, Mich	59.1	22.7	10.6	4.0	2.2	39.5	1.4
		67.7	*18.6*	*7.8*	*1.8*	*.6*	*28.8*	*3.5*
120	Muskegon, Mich	60.9	21.1	10.5	4.4	2.2	38.2	.9
		67.0	*21.1*	*8.1*	*2.2*	*.6*	*32.0*	*1.0*
121	Sault Ste. Marie, Mich	51.0	22.7	11.2	5.8	2.3	42.0	7.0
		48.3	*26.8*	*16.4*	*5.3*	*2.8*	*51.3*	*.4*
122	Meridian, Miss	47.5	18.9	11.6	7.4	6.2	44.1	8.4
		49.2	*18.6*	*11.2*	*6.6*	*3.8*	*40.2*	*10.6*
123	Carthage, Mo	57.7	19.3	11.9	6.0	2.5	39.7	2.6
		59.9	*22.2*	*9.9*	*3.5*	*1.2*	*36.8*	*3.3*
124	Great Falls, Mont	61.5	19.4	10.1	4.2	2.6	36.3	2.2
		66.6	*17.6*	*8.7*	*3.2*	*1.7*	*31.2*	*2.2*
125	Concord, N. H	54.9	18.2	10.9	4.2	2.8	36.1	9.0
		57.4	*18.0*	*8.6*	*3.0*	*1.7*	*31.3*	*11.3*
126	Portsmouth, N. H	64.9	16.1	6.8	2.1	1.6	26.6	8.5
		66.0	*14.6*	*5.7*	*1.9*	*1.0*	*23.2*	*10.8*
127	Bloomfield, N. J	63.0	17.1	6.6	3.9	1.2	28.8	8.2
		64.0	*13.2*	*6.0*	*2.6*	*1.0*	*22.8*	*13.2*
128	Bridgeton, N. J	50.2	12.6	9.3	4.5	3.0	29.4	20.4
		49.8	*12.0*	*5.3*	*2.5*	*1.2*	*21.0*	*29.2*
129	Garfield, N. J	54.7	21.8	12.8	5.7	1.3	41.6	3.7
		55.7	*24.3*	*11.1*	*3.5*	*1.6*	*40.5*	*3.8*
130	Kearny, N. J	56.4	19.6	10.1	2.9	1.7	34.3	9.3
		59.0	*18.0*	*8.3*	*3.3*	*.8*	*30.4*	*10.6*
131	Long Branch, N. J	43.9	18.8	14.7	9.0	7.4	49.9	6.2
		51.5	*18.0*	*12.5*	*8.1*	*3.2*	*41.8*	*6.7*
132	Irvington, N. J	55.3	20.4	11.0	2.7	.8	34.9	9.8
		55.3	*15.2*	*5.6*	*1.5*	*.6*	*22.9*	*21.8*
133	Montclair, N. J	56.0	18.2	10.5	5.6	3.6	37.9	6.1
		58.8	*1.70*	*10.2*	*5.5*	*2.2*	*34.9*	*6.3*
134	Morristown, N. J	50.3	20.6	11.3	6.4	5.8	44.1	5.6
		52.5	*21.3*	*13.2*	*4.7*	*1.2*	*40.4*	*7.1*
135	Plainfield, N. J	53.6	19.0	12.8	6.7	2.4	40.9	5.5
		53.4	*21.2*	*11.5*	*4.4*	*2.0*	*39.1*	*7.5*
136	Town of Union, N. J	50.2	20.8	15.9	6.8	2.8	46.3	3.5
		53.0	*24.7*	*13.0*	*4.0*	*1.3*	*43.0*	*4.0*
137	Vineland, N. J	26.4	32.1	21.8	12.3	6.3	72.5	1.1
		33.1	*30.3*	*20.0*	*11.0*	*3.7*	*65.0*	*1.9*
138	West New York, N. J	62.4	17.1	8.2	4.3	.9	30.5	7.1
		64.6	*15.9*	*6.6*	*2.2*	*1.0*	*25.7*	*9.7*
139	West Orange, N. J	50.1	21.0	17.0	7.3	3.3	48.6	1.3
		58.1	*19.4*	*12.9*	*4.6*	*1.6*	*38.5*	*3.4*
140	Albuquerque, N. Mex	47.7	20.4	14.3	7.7	8.0	50.4	1.9
		54.9	*21.4*	*10.5*	*5.7*	*5.7*	*43.3*	*1.8*
141	Amsterdam, N. Y	58.5	18.9	10.9	4.7	3.6	38.1	3.4
		59.5	*18.1*	*9.1*	*5.0*	*3.4*	*35.6*	*4.9*
142	Dunkirk, N. Y	51.6	17.6	10.2	3.1	3.1	34.0	4.4
		56.9	*18.7*	*8.4*	*2.2*	*.8*	*30.1*	*13.0*
143	Gloversville, N. Y	52.3	18.2	10.8	3.6	2.0	34.6	13.1
		57.9	*14.9*	*7.7*	*3.1*	*2.2*	*27.9*	*14.2*
144	Johnstown, N. Y	49.7	26.4	13.1	5.9	3.1	48.5	1.8
		48.6	*25.5*	*13.7*	*6.8*	*4.6*	*50.6*	*.8*
145	New Rochelle, N. Y	44.6	24.7	15.1	8.0	3.7	51.5	3.9
		47.6	*24.2*	*13.7*	*6.2*	*4.1*	*48.2*	*4.2*
146	Olean, N. Y	55.9	21.2	11.2	3.7	1.6	37.7	6.4
		62.1	*18.6*	*8.6*	*2.8*	*.9*	*30.9*	*7.0*
147	Port Chester, N. Y	60.6	18.8	10.1	2.8	1.1	32.8	6.6
		59.6	*19.0*	*9.3*	*3.1*	*1.6*	*33.0*	*7.4*
148	White Plains, N. Y	51.7	22.3	12.5	6.4	3.6	44.8	3.5
		52.7	*11.0*	*5.7*	*2.5*	*1.0*	*20.2*	*27.1*
149	Asheville, N. C	35.8	20.8	15.2	13.3	14.0	63.3	.9
		36.3	*20.8*	*16.8*	*11.8*	*13.7*	*63.1*	*.6*

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TABLE 8.—*Per cent of the total number of boys and girls who are of normal age, over the normal age, and under the normal age of pupils in their respective grades in certain cities having less than 25,000 population*—Continued.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Of normal age.	Over age.					Under age.
			1 year.	2 years.	3 yrars.	4 years or more.	Total.	
150	Newbern, N. C.	29.9	20.4	20.0	10.5	19.2	70.1	.....
		32.0	*18.6*	*18.5*	*13.9*	*16.9*	*67.9*	*0.1*
151	Alliance, Ohio	56.5	26.0	12.3	3.6	1.4	43.3	.2
		65.8	*22.8*	*8.1*	*2.0*	*.8*	*33.7*	*.5*
152	Newark, Ohio	63.1	20.1	19.6	2.7	1.8	34.2	2.7
		70.2	*19.1*	*5.8*	*2.3*	*.6*	*27.8*	*2.0*
153	Norwood, Ohio	67.0	16.5	8.8	3.2	2.3	30.8	2.2
		71.2	*13.7*	*8.7*	*3.1*	*.7*	*26.2*	*2.6*
154	Portsmouth, Ohio	56.4	18.4	12.5	5.6	4.4	40.9	2.7
		65.4	*16.1*	*8.8*	*3.8*	*2.2*	*30.9*	*3.7*
155	Sidney, Ohio	56.4	15.1	9.7	4.0	3.7	32.5	11.1
		62.9	*14.6*	*8.2*	*1.9*	*.7*	*25.4*	*11.7*
156	Steubenville, Ohio	47.0	23.2	14.3	6.8	5.0	49.3	3.7
		50.6	*24.5*	*13.6*	*5.3*	*2.3*	*45.7*	*3.7*
157	Enid, Okla	55.6	22.7	11.5	6.0	3.0	43.2	1.2
		64.3	*16.7*	*11.8*	*4.3*	*.3*	*33.1*	*2.6*
158	McAlester, Okla	42.4	18.7	15.0	9.7	12.9	56.3	1.3
		49.0	*19.8*	*14.2*	*8.4*	*7.4*	*49.8*	*1.2*
159	Beaver Falls, Pa	52.3	22.8	15.8	5.4	1.7	45.7	2.0
		56.7	*21.3*	*13.4*	*4.1*	*1.3*	*40.1*	*3.2*
160	Carbondale, Pa	63.8	17.0	7.4	3.2	.6	28.2	8.0
		66.0	*15.7*	*6.2*	*2.9*	*.0*	*24.8*	*9.2*
161	Carlisle, Pa	64.7	14.8	7.7	3.0	1.5	27.0	8.3
		70.5	*11.9*	*4.8*	*3.5*	*.6*	*20.8*	*8.7*
162	Charlerol, Pa	48.7	24.5	16.9	7.4	2.1	50.9	.4
		48.5	*25.6*	*15.1*	*7.0*	*1.7*	*49.4*	*2.1*
163	Clearfield, Pa	58.1	20.3	11.7	5.9	1.8	39.7	2.2
		61.1	*18.7*	*13.0*	*4.1*	*1.0*	*36.8*	*2.1*
164	Columbia, Pa	65.1	15.5	7.1	3.5	1.8	27.9	7.0
		68.5	*12.6*	*6.3*	*2.3*	*.6*	*21.8*	*9.7*
165	Donora, Pa	55.1	21.7	14.0	4.8	3.4	43.9	1.0
		67.2	*18.8*	*5.7*	*1.9*	*.2*	*26.6*	*6.2*
166	Franklin, Pa	59.5	23.7	10.3	2.8	1.7	38.5	2.0
		65.5	*20.0*	*6.9*	*2.4*	*1.1*	*30.4*	*4.1*
167	Homestead, Pa	53.1	23.0	12.0	6.5	2.8	44.3	2.6
		62.9	*17.3*	*9.5*	*4.4*	*1.5*	*32.7*	*4.4*
168	Lebanon, Pa	66.7	15.1	5.5	2.8	1.1	24.5	8.8
		71.0	*12.7*	*3.8*	*1.6*	*.9*	*19.0*	*10.0*
169	Mahanoy City, Pa	50.1	22.8	14.0	7.5	4.5	48.8	1.1
		50.5	*23.3*	*14.3*	*6.0*	*4.9*	*48.5*	*1.0*
170	North Braddock, Pa	51.4	21.3	13.2	8.8	4.5	47.8	.8
		55.5	*24.9*	*11.4*	*6.2*	*1.5*	*44.0*	*.5*
171	Plymouth, Pa	62.3	18.4	9.1	3.2	2.2	32.9	4.8
		63.4	*20.2*	*8.5*	*1.9*	*1.0*	*31.6*	*5.0*
172	Pottstown, Pa	67.4	13.9	8.8	3.3	1.5	27.5	5.1
		74.5	*10.1*	*5.1*	*1.8*	*1.5*	*18.5*	*7.0*
173	Sharon, Pa	70.6	12.8	6.6	4.0	1.5	24.9	4.5
		75.2	*13.4*	*4.2*	*1.7*	*.4*	*19.7*	*5.1*
174	Sunbury, Pa	64.7	18.4	8.7	1.8	2.5	31.4	3.9
		69.5	*14.6*	*8.4*	*1.9*	*.8*	*25.7*	*4.8*
175	Warren, Pa	57.3	21.9	12.1	5.6	1.5	41.1	1.6
		61.5	*24.0*	*9.0*	*2.2*	*1.5*	*36.7*	*1.8*
176	Central Falls, R. I	53.4	12.0	7.0	4.6	2.8	26.4	20.2
		53.9	*11.5*	*5.4*	*2.5*	*1.1*	*20.5*	*25.6*
177	Spartanburg, S. C	39.8	27.1	15.6	8.6	8.6	59.9	.3
		41.3	*20.7*	*17.8*	*8.6*	*10.8*	*57.9*	*.8*
178	Beaumont, Tex	30.2	28.9	18.6	12.3	9.9	69.7	.1
		29.2	*30.1*	*17.8*	*13.3*	*9.3*	*70.5*	*.3*
179	Ogden, Utah	45.1	23.0	14.8	5.6	2.2	45.6	9.3
		55.1	*28.0*	*11.5*	*13.5*	*.9*	*43.9*	*1.0*
180	Everett, Wash.	60.2	19.3	8.8	2.7	.9	31.7	8.1
		67.7	*15.3*	*4.7*	*2.0*	*.8*	*22.8*	*9.5*
181	Clarksburg, W. Va	52.8	19.2	12.6	6.4	6.4	44.6	2.6
		58.9	*18.9*	*10.0*	*4.9*	*3.2*	*37.0*	*4.1*
182	Appleton, Wis	62.9	19.2	9.6	4.6	1.7	35.1	2.0
		71.8	*18.2*	*5.0*	*2.0*	*.5*	*25.7*	*2.5*
183	Beloit, Wis	61.9	20.1	10.3	3.8	2.1	36.3	1.8
		65.6	*19.6*	*8.1*	*3.1*	*1.3*	*32.1*	*2.3*
184	Fond du Lac, Wis	49.4	26.6	13.6	5.9	3.6	49.7	.9
		57.0	*23.8*	*11.9*	*4.2*	*1.8*	*41.7*	*1.3*
185	Marinette, Wis	62.5	18.2	10.8	4.2	1.8	35.0	2.5
		67.8	*19.6*	*6.7*	*2.8*	*.3*	*29.4*	*2.8*
186	Wausau, Wis	53.3	26.5	13.2	3.6	.7	44.0	2.7
		59.3	*27.3*	*8.7*	*1.8*	*.5*	*38.3*	*2.4*

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TABLE 9.—*Percentage relation between the largest age group and the number found in each grade in certain cities of 25,000 population and over.*

[Throughout this table, the figures that represent girls are printed in italics.]

	Cities.	Largest age group.	Elementary school grades.									High school years.			
			1	2	3	4	5	6	7	8	9	1	2	3	4
1	Birmingham, Ala	407	200	127	118	101	81	61	42	.....	.....	36	21	15	4
		444	*170*	*125*	*116*	*107*	*85*	*72*	*48*	.....	.....	*43*	*31*	*22*	*17*
2	Mobile, Ala	212	167	129	106	126	68	68	53	.....	.....	41	21	10	7
		218	*143*	*102*	*115*	*108*	*95*	*92*	*75*	.....	.....	*67*	*45*	*35*	*32*
3	Montgomery, Ala	231	169	135	106	111	74	58	30	.....	.....	19	8	3	3
		242	*157*	*137*	*130*	*98*	*79*	*68*	*48*	.....	.....	*46*	*39*	*18*	*16*
4	Little Rock, Ark	296	209	141	124	127	79	78	83	61	.....	31	24	14	10
		312	*200*	*145*	*130*	*125*	*91*	*87*	*79*	*66*	.....	*44*	*41*	*24*	*13*
5	Los Angeles, Cal	1,682	154	111	112	116	110	97	82	64	.....	56	21	12	10
		1,533	*143*	*110*	*121*	*118*	*112*	*110*	*94*	*76*	.....	*56*	*25*	*17*	*15*
6	Pueblo (Dist. No. 20), Colo	162	171	124	111	111	112	80	64	48	.....	33	30	17	11
		158	*162*	*87*	*113*	*125*	*110*	*89*	*75*	*57*	.....	*43*	*44*	*37*	*18*
7	Pueblo, Colo	126	150	132	106	103	101	80	76	43	.....	44	23	13	7
		128	*124*	*101*	*120*	*94*	*110*	*77*	*91*	*60*	.....	*76*	*32*	*25*	*21*
8	Bridgeport, Conn	644	247	137	150	125	98	63	44	24	.....	14	13	8	4
		643	*242*	*137*	*149*	*128*	*99*	*64*	*45*	*25*	.....	*15*	*17*	*10*	*7*
9	New Haven, Conn	1,025	147	133	133	122	103	88	71	56	.....	43	23	19	11
		1,010	*146*	*130*	*130*	*128*	*107*	*96*	*74*	*46*	.....	*43*	*22*	*25*	*18*
10	Meriden, Conn	208	123	106	103	112	101	83	74	54	43	44	24	7	8
		187	*116*	*99*	*102*	*115*	*103*	*97*	*99*	*66*	*52*	*50*	*36*	*19*	*16*
11	Waterbury, Conn	484	158	137	122	124	107	88	65	44	34	26	18	12	9
		458	*156*	*131*	*139*	*120*	*111*	*87*	*71*	*50*	*42*	*31*	*23*	*16*	*13*
12	(a) Savannah, Ga	269	145	142	146	97	102	60	44	36	.....	22	14	7	5
		279	*128*	*128*	*125*	*102*	*100*	*79*	*65*	*53*	.....	*42*	*29*	*11*	*5*
	(b) Savannah, Ga. (colored)	127	150	148	134	80	79	38	40	37	.....	.....	.....	.....	.....
		169	*160*	*126*	*153*	*110*	*104*	*69*	*43*	*39*	.....	.....	.....	.....	.....
13	Aurora, Ill	136	152	93	98	84	72	73	107	93	.....	58	34	31	15
		132	*135*	*92*	*80*	*97*	*79*	*64*	*92*	*35*	.....	*66*	*43*	*36*	*18*
14	Aurora (West Side), Ill	70	92	107	114	76	101	73	62	50	.....	46	53	34	24
		79	*91*	*163*	*122*	*59*	*69*	*63*	*65*	*41*	.....	*37*	*54*	*45*	*23*
15	Chicago, Ill	12,652	162	126	133	116	108	87	69	55	.....	24	12	8	5
		12,246	*146*	*119*	*131*	*113*	*107*	*89*	*76*	*64*	.....	*30*	*17*	*10*	*7*
16	Danville, Ill	229	176	125	134	112	95	68	54	41	.....	27	15	16	7
		229	*177*	*119*	*120*	*103*	*94*	*75*	*71*	*50*	.....	*35*	*23*	*18*	*14*
17	Decatur, Ill	241	133	123	119	129	101	84	63	.....	.....	43	22	24	15
		254	*118*	*115*	*115*	*127*	*94*	*96*	*79*	.....	.....	*49*	*32*	*27*	*23*
18	Joliet, Ill	284	154	128	103	104	105	80	82	62	.....	.....	.....	.....	.....
		272	*150*	*113*	*111*	*99*	*94*	*95*	*84*	*72*	.....	.....	.....	.....	.....
19	Quincy, Ill	207	171	126	147	117	89	72	67	41	.....	29	22	14	12
		185	*169*	*132*	*131*	*113*	*102*	*84*	*72*	*65*	.....	*56*	*28*	*29*	*24*

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20	Rockford, Ill.	346	144	124	113	118	103	85	66	44	.....	35	30	25	14
		337	*128*	*111*	*113*	*115*	*111*	*98*	*80*	*51*	.....	*47*	*30*	*30*	*19*
21	Springfield, Ill.	350	155	120	120	116	100	78	61	43	.....	44	22	11	10
		350	*150*	*120*	*114*	*115*	*82*	*77*	*60*	*54*	.....	*56*	*29*	*25*	*13*
22	Anderson, Ind.	196	202	105	120	97	95	54	46	30	.....	42	23	21	20
		188	*185*	*117*	*105*	*84*	*108*	*63*	*56*	*43*	.....	*48*	*26*	*24*	*22*
23	Fort Wayne, Ind.	294	149	113	101	111	110	83	67	57	.....	42	26	11	6
		316	*133*	*107*	*102*	*114*	*95*	*86*	*72*	*66*	.....	*44*	*26*	*16*	*11*
24	Indianapolis, Ind.	1,458	150	120	121	106	103	79	69	53	.....	34	21	17	7
		1,325	*71*	*108*	*122*	*119*	*114*	*97*	*77*	*58*	.....	*36*	*32*	*23*	*17*
25	Marion, Ind.	176	132	114	113	107	123	88	74	68	.....	35	24	14	11
		175	*113*	*102*	*117*	*104*	*107*	*102*	*83*	*77*	.....	*55*	*34*	*18*	*13*
26	Muncie, Ind.	189	184	115	112	103	90	87	51	38	.....	.....	.....	.....	.....
		196	*165*	*131*	*103*	*111*	*92*	*78*	*78*	*50*	.....	.....	.....	.....	.....
27	Terre Haute, Ind.	479	195	109	115	94	86	70	49	40	.....	28	17	13	8
		444	*188*	*105*	*117*	*110*	*91*	*77*	*61*	*49*	.....	*31*	*21*	*14*	*18*
28	Burlington, Iowa	182	175	122	111	117	104	87	62	45	.....	37	18	8	8
		263	*141*	*106*	*99*	*124*	*99*	*92*	*74*	*56*	.....	*48*	*25*	*17*	*12*
29	Council Bluffs, Iowa	276	152	116	111	114	92	88	52	60	.....	24	17	8	10
		262	*137*	*100*	*138*	*116*	*93*	*104*	*74*	*61*	.....	*39*	*21*	*17*	*16*
30	Des Moines, Iowa	614	116	129	117	112	92	78	69	51	.....	41	34	23	21
		603	*148*	*125*	*112*	*118*	*97*	*75*	*78*	*61*	.....	*51*	*48*	*28*	*25*
31	Dubuque, Iowa	165	106	115	106	102	108	106	63	67	.....	51	25	16	17
		174	*87*	*89*	*106*	*104*	*88*	*89*	*75*	*67*	.....	*52*	*26*	*20*	*24*
32	Kansas City, Kans.	478	201	138	122	120	98	79	62	45	.....	37	18	14	11
		469	*200*	*125*	*129*	*126*	*103*	*92*	*78*	*72*	.....	*62*	*53*	*27*	*22*
33	Topeka, Kans.	309	135	122	117	118	103	83	77	67	.....	52	44	23	20
		303	*149*	*200*	*114*	*108*	*91*	*93*	*94*	*75*	.....	*58*	*48*	*36*	*35*
34	Wichita, Kans.	289	195	114	123	126	110	91	71	57	.....	43	17	11	10
		342	*164*	*96*	*108*	*112*	*100*	*103*	*72*	*67*	.....	*44*	*29*	*21*	*14*
35	Covington, Ky.	213	136	138	110	113	82	84	55	31	.....	26	18	15	7
		198	*128*	*121*	*126*	*121*	*97*	*92*	*74*	*45*	.....	*46*	*12*	*14*	*5*
36	Louisville, Ky.	1,280	183	129	125	118	102	80	64	52	.....	32	22	14	9
		1,389	*147*	*110*	*112*	*106*	*90*	*90*	*66*	*62*	.....	*38*	*23*	*19*	*13*
37	Lewiston, Me.	109	110	106	100	95	76	85	68	53	64	51	22	30	18
		95	*122*	*108*	*99*	*93*	*104*	*82*	*72*	*63*	*69*	*52*	*34*	*41*	*26*
38	Brockton, Mass.	416	110	115	118	110	117	108	102	76	61	46	24	22	17
		408	*97*	*105*	*112*	*111*	*114*	*104*	*102*	*72*	*64*	*55*	*35*	*26*	*23*
39	Everett, Mass.	305	122	104	108	113	121	112	95	79	58	28	22	16	11
		325	*125*	*103*	*102*	*105*	*102*	*101*	*98*	*84*	*69*	*38*	*29*	*19*	*12*
40	Fall River, Mass.	839	183	122	119	118	85	68	45	34	22	18	12	10	6
		782	*183*	*120*	*121*	*106*	*91*	*64*	*52*	*31*	*27*	*19*	*15*	*10*	*9*
41	Fitchburg, Mass.	200	145	126	128	107	85	76	88	60	.....	70	42	25	20
		215	*117*	*109*	*116*	*113*	*84*	*77*	*77*	*69*	.....	*54*	*41*	*38*	*20*
42	Haverhill, Mass.	278	129	99	107	87	110	91	61	74	67	38	30	19	18
		263	*119*	*105*	*96*	*115*	*99*	*111*	*97*	*92*	*76*	*49*	*29*	*25*	*29*
43	Holyoke, Mass.	324	113	110	101	100	102	73	61	53	51	50	22	17	8
		307	*112*	*86*	*102*	*115*	*98*	*96*	*68*	*51*	*50*	*46*	*35*	*23*	*18*
44	Lowell, Mass.	601	150	138	103	104	98	80	69	55	45	32	26	19	12
		566	*151*	*118*	*101*	*107*	*94*	*89*	*67*	*59*	*53*	*36*	*30*	*23*	*17*
45	Malden, Mass.	348	146	109	110	111	108	91	84	72	58	49	28	20	14
		342	*141*	*106*	*107*	*107*	*105*	*89*	*88*	*70*	*57*	*47*	*27*	*20*	*14*

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TABLE 9.—*Percentage relation between the largest age group and the number found in each grade in certain cities of 25,000 population and over*—Contd.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Largest age group.	Elementary school grades.									High school years.			
			1	2	3	4	5	6	7	8	9	1	2	3	4
46	New Bedford, Mass	713	134	115	107	88	76	65	42	26	18	14	8	6	3
		614	*154*	*124*	*112*	*110*	*106*	*77*	*56*	*35*	*22*	*17*	*14*	*9*	*8*
47	Newton, Mass	274	132	106	101	113	99	89	105	74	61	50	52	34	25
		275	*109*	*104*	*116*	*99*	*104*	*83*	*88*	*89*	*71*	*56*	*34*	*43*	*36*
48	Pittsfield, Mass	241	131	108	110	114	104	85	74	57	40	31	24	12	13
		214	*138*	*125*	*127*	*111*	*105*	*93*	*91*	*55*	*49*	*44*	*39*	*19*	*10*
49	Quincy, Mass	365	130	110	101	67	97	115	81	66	.....	48	27	17	13
		347	*138*	*106*	*97*	*65*	*96*	*120*	*81*	*62*	.....	*47*	*28*	*18*	*16*
50	Somerville, Mass	574	128	117	109	116	112	101	90	76	63	43	35	21	17
		549	*122*	*114*	*115*	*101*	*108*	*103*	*99*	*74*	*71*	*59*	*44*	*34*	*32*
51	Taunton, Mass	226	161	134	116	108	89	94	65	64	47	29	15	12	9
		220	*152*	*115*	*123*	*102*	*103*	*96*	*76*	*69*	*54*	*40*	*33*	*20*	*14*
52	Waltham, Mass	141	108	110	80	92	90	92	104	87	57	54	40	24	21
		157	*90*	*90*	*82*	*101*	*88*	*91*	*83*	*68*	*66*	*64*	*43*	*29*	*31*
53	Worcester, Mass	986	129	111	103	103	99	85	72	64	49	32	23	16	13
		912	*114*	*113*	*110*	*99*	*103*	*89*	*77*	*66*	*53*	*37*	*34*	*16*	*17*
54	Battle Creek, Mich	165	124	107	120	122	106	82	82	49	.....	61	27	21	10
		187	*106*	*91*	*119*	*89*	*85*	*90*	*84*	*63*	.....	*70*	*26*	*31*	*31*
55	Bay City, Mich	326	183	118	98	85	93	82	62	47	.....	42	22	13	12
		277	*186*	*119*	*94*	*98*	*88*	*100*	*71*	*73*	.....	*51*	*30*	*25*	*17*
56	Calumet, Mich	310	121	121	98	118	102	81	66	36	.....	17	14	9	11
		292	*125*	*110*	*110*	*112*	*84*	*76*	*73*	*50*	.....	*26*	*31*	*15*	*17*
57	Detroit, Mich	2,267	156	123	123	112	103	82	68	45	.....	33	18	15	11
		2,110	*153*	*115*	*125*	*114*	*108*	*85*	*71*	*53*	.....	*35*	*25*	*18*	*14*
58	Grand Rapids, Mich	598	176	121	122	111	110	85	76	71	.....	45	36	15	14
		612	*167*	*116*	*112*	*103*	*95*	*93*	*79*	*65*	.....	*42*	*45*	*19*	*18*
59	Kalamazoo, Mich	237	134	112	121	100	111	96	79	72	53	30	21	15	.....
		240	*137*	*116*	*118*	*115*	*95*	*98*	*102*	*87*	*64*	*45*	*26*	*23*	.....
60	Saginaw, Mich	192	128	122	112	103	101	104	106	81	.....	78	43	26	20
		199	*121*	*107*	*106*	*102*	*105*	*98*	*101*	*74*	.....	*73*	*50*	*27*	*29*
61	Saginaw (West Side), Mich	144	119	122	115	107	108	96	84	74	.....	45	23	7	7
		139	*125*	*107*	*100*	*100*	*109*	*85*	*92*	*77*	.....	*48*	*28*	*22*	*14*
62	Duluth, Minn	570	168	117	120	112	119	97	66	51	.....	27	18	10	9
		578	*147*	*99*	*119*	*110*	*102*	*93*	*73*	*67*	.....	*35*	*21*	*17*	*12*
63	Minneapolis, Minn	1,852	170	122	116	122	122	105	90	69	.....	45	32	18	14
		1,900	*157*	*110*	*107*	*116*	*112*	*103*	*97*	*86*	.....	*54*	*44*	*24*	*22*
64	St. Joseph, Mo	519	167	125	124	114	94	83	56	47	.....	39	19	10	8
		507	*154*	*114*	*118*	*117*	*102*	*92*	*78*	*54*	.....	*42*	*31*	*13*	*14*
65	St. Louis, Mo	3,893	142	123	121	118	94	69	53	38	.....	18	10	7	4
		3,914	*136*	*121*	*113*	*110*	*93*	*73*	*58*	*49*	.....	*27*	*18*	*11*	*9*

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66	Butte, Mont.	303	169	114	122	106	99	98	76	50	.....	.....	.....	.....	.....
		315	*159*	*109*	*109*	*110*	*101*	*89*	*84*	*53*	.....	.....	.....	.....	.....
67	East Orange, N. J.	222	159	139	135	116	101	66	76	54	.....	59	28	19	13
		219	*139*	*124*	*130*	*118*	*93*	*96*	*70*	*68*	.....	*65*	*38*	*23*	*14*
68	Hoboken, N. J.	498	166	126	122	104	84	63	51	32	.....	13	7	4	3
		485	*162*	*128*	*107*	*110*	*79*	*67*	*50*	*37*	.....	*18*	*8*	*2*	*2*
69	New Brunswick, N. J.	150	100	107	107	85	92	61	56	36	.....	50	31	17	12
		130	*131*	*99*	*122*	*109*	*82*	*55*	*65*	*60*	.....	*61*	*29*	*33*	*19*
70	Orange, N. J.	235	232	79	77	79	74	39	36	25	.....	18	10	8	4
		200	*273*	*93*	*91*	*93*	*87*	*46*	*42*	*30*	.....	*21*	*11*	*9*	*4*
71	Paterson, N. J.	878	148	134	123	112	107	83	57	43	.....	24	17	11	4
		904	*127*	*117*	*114*	*107*	*102*	*79*	*59*	*45*	.....	*25*	*20*	*12*	*8*
72	Passaic, N. J.	332	167	137	134	113	84	40	36	32	.....	20	14	6	5
		307	*189*	*139*	*114*	*107*	*84*	*56*	*38*	*27*	.....	*22*	*16*	*7*	*9*
73	Perth Amboy, N. J.	241	254	131	103	102	94	61	52	29	.....	23	14	13	8
		255	*248*	*111*	*95*	*93*	*75*	*52*	*46*	*38*	.....	*16*	*15*	*12*	*11*
74	Trenton, N. J.	541	185	144	139	117	92	66	47	32	.....	23	13	11	6
		577	*172*	*121*	*127*	*98*	*90*	*73*	*50*	*46*	.....	*32*	*19*	*17*	*8*
75	Albany, N. Y.	498	154	116	121	141	120	86	82	59	.....	36	20	16	13
		514	*136*	*97*	*89*	*126*	*108*	*93*	*79*	*61*	.....	*37*	*32*	*24*	*16*
76	Auburn, N. Y.	182	145	110	113	125	103	98	81	50	.....	68	30	14	19
		170	*143*	*106*	*114*	*113*	*116*	*109*	*79*	*66*	.....	*69*	*34*	*7*	*21*
77	Elmira, N. Y.	204	176	127	117	126	115	103	72	60	.....	48	35	30	23
		222	*137*	*98*	*87*	*105*	*107*	*93*	*84*	*60*	.....	*61*	*38*	*37*	*29*
78	Jamestown, N. Y.	235	114	96	121	114	108	91	86	52	37	29	18	12	8
		217	*96*	*100*	*111*	*117*	*114*	*98*	*79*	*64*	*52*	*44*	*22*	*21*	*18*
79	Kingston, N. Y.	202	185	94	101	123	99	78	61	48	.....	77	19	16	7
		194	*170*	*97*	*112*	*111*	*91*	*85*	*72*	*65*	.....	*75*	*19*	*21*	*15*
80	Newburgh, N. Y.	188	144	103	110	104	106	97	60	46	.....	41	28	15	10
		202	*124*	*94*	*104*	*99*	*85*	*83*	*71*	*54*	.....	*45*	*29*	*15*	*15*
81	Niagara Falls, N. Y.	189	133	129	110	115	104	79	84	49	.....	74	20	20	9
		178	*149*	*115*	*108*	*117*	*99*	*84*	*69*	*52*	.....	*92*	*33*	*27*	*21*
82	Poughkeepsie, N. Y.	166	124	95	101	84	101	74	82	76	.....	62	21	21	9
		171	*123*	*81*	*86*	*94*	*89*	*58*	*69*	*101*	.....	*64*	*35*	*21*	*23*
83	Rochester, N. Y.	1,021	139	121	125	102	102	94	73	57	.....	.....	.....	.....	.....
		1,024	*124*	*106*	*108*	*107*	*109*	*95*	*79*	*66*	.....	.....	.....	.....	.....
84	Schenectady, N. Y.	546	179	118	123	115	103	74	48	38	.....	19	18	12	9
		488	*178*	*123*	*115*	*131*	*106*	*87*	*60*	*43*	.....	*23*	*22*	*11*	*15*
85	Syracuse, N. Y.	825	143	122	121	113	100	91	77	57	.....	56	26	12	7
		805	*124*	*119*	*117*	*120*	*111*	*95*	*83*	*61*	.....	*59*	*30*	*21*	*15*
86	Troy, N. Y.	999	182	104	95	156	98	83	53	39	.....	24	25	17	11
		263	*187*	*107*	*109*	*138*	*111*	*83*	*67*	*52*	.....	*31*	*32*	*22*	*18*
87	Utica, N. Y.	460	141	114	115	105	92	85	87	54	.....	36	15	13	7
		407	*140*	*117*	*118*	*98*	*87*	*84*	*110*	*59*	.....	*65*	*19*	*23*	*10*
88	Watertown, N. Y.	223	152	126	121	136	104	93	65	56	.....	35	28	19	14
		224	*151*	*97*	*120*	*114*	*104*	*84*	*76*	*55*	.....	*45*	*39*	*25*	*18*
89	Yonkers, N. Y.	624	221	135	120	100	80	69	43	37	.....	33	19	13	6
		574	*242*	*128*	*115*	*107*	*90*	*76*	*51*	*39*	.....	*46*	*21*	*14*	*9*
90	Akron, Ohio.	429	134	115	111	118	107	102	103	78	.....	61	29	16	8
		446	*123*	*114*	*107*	*115*	*96*	*93*	*93*	*69*	.....	*53*	*23*	*37*	*26*
91	Canton, Ohio.	313	151	141	115	111	104	95	77	66	.....	48	30	18	13
		335	*135*	*121*	*110*	*103*	*97*	*92*	*75*	*52*	.....	*55*	*31*	*16*	*22*

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TABLE 9.—*Percentage relation between the largest age group and the number found in each grade in certain cities of 25,000 population and over*—Contd.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Largest age group.	Elementary school grades.									High school years.			
			1	2	3	4	5	6	7	8	9	1	2	3	4
92	Columbus, Ohio	1,084	177	114	135	133	113	87	69	56	.....	48	30	21	15
		1,118	*159*	*109*	*125*	*130*	*118*	*91*	*70*	*63*	.....	*54*	*34*	*21*	*18*
93	Dayton, Ohio	625	132	124	123	108	114	96	68	50	.....	46	20	16	14
		630	*118*	*118*	*113*	*121*	*105*	*86*	*68*	*57*	.....	*44*	*30*	*24*	*20*
94	Hamilton, Ohio	264	140	121	115	100	103	77	57	37	.....	31	19	13	11
		237	*130*	*109*	*129*	*106*	*104*	*85*	*56*	*42*	.....	*30*	*17*	*21*	*13*
95	Springfield, Ohio	309	132	128	123	121	125	98	78	59	.....	48	25	13	7
		285	*125*	*120*	*122*	*110*	*112*	*100*	*91*	*70*	.....	*56*	*42*	*23*	*21*
96	Toledo, Ohio	1,010	148	124	120	124	122	92	73	52	.....	45	19	10	7
		1,002	*142*	*115*	*111*	*115*	*99*	*91*	*73*	*59*	.....	*45*	*26*	*15*	*12*
97	Youngstown, Ohio	420	215	131	102	123	115	85	61	52	.....	.....	.....	.....	.....
		444	*206*	*123*	*105*	*104*	*83*	*80*	*62*	*48*	.....	.....	.....	.....	.....
98	Allentown, Pa.	429	134	102	96	106	98	102	60	40	.....	19	13	6	6
		405	*134*	*105*	*103*	*105*	*118*	*86*	*62*	*40*	.....	*28*	*17*	*13*	*5*
99	Altoona, Pa.	344	157	128	122	130	113	99	79	62	.....	39	21	16	15
		372	*141*	*114*	*112*	*131*	*116*	*100*	*66*	*52*	.....	*36*	*22*	*18*	*19*
100	Easton, Pa.	233	130	114	128	125	112	80	44	33	.....	27	18	17	13
		239	*120*	*108*	*116*	*112*	*105*	*93*	*42*	*35*	.....	*34*	*18*	*21*	*14*
101	Erie, Pa.	358	173	169	203	115	93	51	21	.....	.....	41	27	20	9
		364	*151*	*165*	*169*	*110*	*96*	*57*	*32*	.....	.....	*40*	*34*	*20*	*12*
102	Harrisburg, Pa.	484	133	106	86	118	102	78	55	52	.....	32	29	16	7
		437	*139*	*116*	*97*	*141*	*102*	*78*	*64*	*58*	*43*	*33*	*32*	*12*	*16*
103	Lancaster, Pa.	345	108	113	98	96	99	79	63	44	.....	31	21	11	5
		303	*110*	*118*	*107*	*109*	*85*	*83*	*70*	*59*	.....	*45*	*22*	*21*	*15*
104	Newcastle, Pa.	269	152	119	127	127	86	91	66	51	.....	32	15	12	5
		307	*127*	*109*	*96*	*104*	*90*	*85*	*66*	*50*	.....	*45*	*28*	*23*	*7*
105	Norristown, Pa.	155	174	118	131	85	107	90	83	57	.....	58	41	48	10
		177	*120*	*91*	*102*	*108*	*95*	*80*	*68*	*42*	.....	*43*	*43*	*27*	*24*
106	Philadelphia, Pa.	7,860	175	148	139	115	95	72	47	38	.....	23	17	11	3
		8,134	*159*	*139*	*135*	*115*	*93*	*76*	*51*	*39*	.....	*19*	*13*	*9*	*6*
107	Pittsburg, Pa.	2,330	207	153	136	117	94	79	58	38	.....	23	14	7	3
		2,297	*196*	*146*	*132*	*117*	*97*	*78*	*62*	*42*	.....	*26*	*16*	*7*	*4*
108	Reading, Pa.	609	120	123	114	124	120	79	45	36	.....	32	23	18	7
		614	*136*	*115*	*111*	*129*	*87*	*79*	*52*	*39*	.....	*31*	*21*	*19*	*9*
109	Wilkes-Barre, Pa.	562	166	97	88	88	81	66	51	43	.....	31	21	15	14
		488	*164*	*105*	*97*	*95*	*81*	*83*	*62*	*54*	.....	*40*	*24*	*17*	*16*
110	Williamsport, Pa.	287	125	103	111	131	104	84	72	44	36	42	18	11	6
		272	*143*	*102*	*109*	*124*	*120*	*93*	*77*	*63*	*52*	*46*	*30*	*13*	*16*
111	York, Pa.	335	128	117	122	110	115	93	71	52	.....	35	26	15	9
		331	*126*	*112*	*114*	*121*	*106*	*92*	*71*	*43*	.....	*44*	*22*	*15*	*13*

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112	Newport, R. I.	183	116	122	116	98	99	89	76	69	68	40	22	14	8
		179	*127*	*96*	*91*	*98*	*109*	*83*	*84*	*81*	*61*	*46*	*29*	*19*	*15*
113	Providence, R. I.	1,349	149	122	126	121	113	98	73	54	.....	33	18	15	11
		1,360	*147*	*114*	*124*	*116*	*99*	*97*	*72*	*62*	.....	*41*	*26*	*17*	*12*
114	Warwick, R. I.	172	219	121	121	109	100	88	45	37	31	31	17	11	6
		183	*180*	*109*	*125*	*105*	*86*	*64*	*40*	*42*	*37*	*21*	*18*	*14*	*15*
115	Woonsocket, R. I.	214	192	129	111	99	79	61	45	32	23	21	10	5	4
		190	*189*	*114*	*129*	*105*	*96*	*69*	*49*	*41*	*28*	*25*	*12*	*9*	*14*
116	Columbia, S. C.	97	227	123	99	90	74	49	38	.....	.....	30	29	10	.....
		97	*229*	*100*	*115*	*111*	*100*	*74*	*64*	.....	.....	*68*	*26*	*17*	.....
117	Nashville, Tenn.	851	169	128	123	105	82	65	43	33	.....	20	11	8	.....
		980	*157*	*113*	*120*	*121*	*89*	*72*	*62*	*38*	.....	*32*	*15*	*12*	.....
118	Dallas, Tex.	523	174	126	110	102	81	59	47	22	.....	24	20	9	5
		574	*163*	*115*	*113*	*108*	*89*	*81*	*63*	*38*	.....	*46*	*23*	*13*	*11*
119	Galveston, Tex.	224	179	134	131	100	64	40	34	14	.....	16	10	4	5
		248	*148*	*123*	*117*	*105*	*76*	*60*	*56*	*25*	.....	*28*	*19*	*11*	*8*
120	Houston, Tex.	514	190	143	119	105	65	42	47	.....	.....	20	17	8	4
		479	*178*	*147*	*138*	*110*	*67*	*46*	*29*	.....	.....	*39*	*17*	*18*	*10*
121	San Antonio, Tex.	581	225	129	112	104	67	47	32	25	.....	24	9	10	.....
		582	*185*	*130*	*110*	*102*	*82*	*61*	*46*	*37*	.....	*29*	*16*	*12*	.....
122	Salt Lake City, Utah.	763	188	126	153	142	114	79	60	.....	.....	30	17	12	8
		756	*172*	*114*	*121*	*120*	*98*	*95*	*79*	*70*	.....	*34*	*24*	*12*	*10*
123	Lynchburg, Va.	214	200	151	102	96	71	65	48	.....	.....	31	20	12	4
		197	*171*	*140*	*103*	*118*	*81*	*73*	*53*	.....	.....	*40*	*36*	*24*	*14*
124	Seattle, Wash.	1,200	155	125	111	131	118	102	94	68	.....	60	32	19	13
		1,229	*126*	*107*	*104*	*121*	*112*	*105*	*88*	*74*	.....	*63*	*40*	*22*	*16*
125	Spokane, Wash.	604	166	129	120	121	119	105	80	60	.....	44	30	18	13
		612	*153*	*119*	*111*	*115*	*107*	*96*	*89*	*74*	.....	*56*	*35*	*25*	*20*
126	Tacoma, Wash.	565	143	112	96	102	102	103	90	68	.....	48	26	18	15
		501	*142*	*107*	*96*	*105*	*106*	*104*	*91*	*76*	.....	*54*	*39*	*29*	*19*
127	Green Bay, Wis.	174	278	98	98	98	79	72	60	53	.....	63	28	26	21
		204	*250*	*90*	*80*	*85*	*67*	*59*	*51*	*55*	.....	*68*	*26*	*25*	*21*
128	La Crosse, Wis.	204	178	144	131	127	108	104	68	55	.....	47	25	16	7
		196	*169*	*151*	*128*	*111*	*108*	*103*	*89*	*55*	.....	*43*	*25*	*26*	*15*
129	Madison, Wis.	156	143	115	130	107	105	92	81	55	.....	56	46	46	26
		169	*103*	*99*	*109*	*121*	*95*	*94*	*78*	*65*	.....	*65*	*44*	*54*	*33*
130	Racine, Wis.	280	112	106	113	107	111	101	85	60	.....	41	26	14	3
		262	*109*	*100*	*104*	*110*	*99*	*92*	*84*	*73*	.....	*45*	*32*	*15*	*12*
131	Sheboygan, Wis.	162	141	116	118	109	102	85	79	62	.....	36	22	27	9
		163	*156*	*112*	*100*	*90*	*87*	*74*	*72*	*62*	.....	*34*	*32*	*29*	*13*
132	Superior, Wis.	273	136	132	90	98	100	83	66	62	.....	42	21	13	11
		269	*122*	*109*	*85*	*99*	*96*	*88*	*63*	*60*	.....	*44*	*24*	*20*	*18*

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TABLE 10.—*Percentage relation between the largest age group and the number found in each grade in certain cities of less than 25,000 population.*

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Largest age group.	Elementary school grades.									High school years.			
			1	2	3	4	5	6	7	8	9	1	2	3	4
1	Fort Smith, Ark	158	182	113	141	149	97	77	65	63	.....	36	24	17	7
		157	*155*	*138*	*115*	*127*	*97*	*97*	*82*	*65*	.....	*53*	*31*	*30*	*32*
2	Hot Springs, Ark	145	262	127	117	92	69	53	42	.....	.....	45	16	8	5
		157	*267*	*108*	*122*	*109*	*78*	*66*	*60*	.....	.....	*55*	*12*	*19*	*6*
3	Alameda, Cal	180	122	101	115	98	111	99	89	68	.....	40	25	11	15
		179	*108*	*93*	*108*	*112*	*99*	*100*	*114*	*76*	.....	*67*	*44*	*18*	*18*
4	Fresno, Cal	207	197	137	114	121	86	63	75	44	.....	49	32	16	9
		229	*167*	*107*	*100*	*91*	*65*	*68*	*75*	*52*	.....	*45*	*35*	*19*	*11*
5	Pasadena, Cal	220	125	115	106	106	120	104	93	60	.....	47	31	35	24
		214	*107*	*100*	*116*	*111*	*111*	*107*	*103*	*84*	.....	*74*	*58*	*31*	*33*
6	Riverside, Cal	121	125	100	79	101	134	105	88	67	.....	114	37	30	28
		108	*125*	*91*	*101*	*115*	*125*	*107*	*106*	*87*	.....	*75*	*50*	*42*	*33*
7	Santa Barbara, Cal	83	118	79	90	87	79	87	69	50	.....	66	29	24	15
		77	*89*	*84*	*98*	*102*	*105*	*89*	*42*	*88*	.....	*106*	*50*	*21*	*23*
8	Santa Cruz, Cal	79	160	121	105	98	111	97	71	61	.....	41	33	22	11
		89	*129*	*99*	*94*	*94*	*99*	*88*	*101*	*67*	.....	*57*	*26*	*33*	*28*
9	Stockton, Cal	139	116	107	119	135	107	108	100	68	.....	45	21	28	8
		130	*117*	*93*	*92*	*112*	*119*	*112*	*89*	*51*	.....	*62*	*51*	*34*	*24*
10	Vallejo, Cal	78	120	106	121	94	103	85	57	28	.....	11	16	15	15
		69	*106*	*74*	*129*	*108*	*104*	*104*	*62*	*49*	.....	*44*	*21*	*32*	*19*
11	Canon City, Colo	58	100	104	109	116	113	75	79	44	.....	22	27	27	22
		47	*94*	*79*	*104*	*106*	*104*	*79*	*102*	*62*	.....	*81*	*40*	*34*	*26*
12	Grand Junction, Colo	78	179	122	117	127	94	103	93	39	.....	86	29	25	19
		76	*132*	*122*	*102*	*122*	*93*	*110*	*91*	*68*	.....	*90*	*37*	*31*	*25*
13	Ansonia, Conn	149	145	124	107	133	106	92	62	53	.....	.....	.....	.....	.....
		136	*145*	*137*	*127*	*111*	*111*	*92*	*77*	*57*	.....	.....	.....	.....	.....
14	Danbury, Conn	142	117	149	122	139	115	92	58	43	.....	49	25	14	.....
		130	*102*	*137*	*124*	*146*	*90*	*89*	*72*	*44*	.....	*61*	*43*	*18*	.....
15	Middletown, Conn	87	95	95	106	107	91	69	70	52	28	81	62	49	35
		72	*95*	*94*	*95*	*67*	*85*	*85*	*76*	*42*	*47*	*93*	*72*	*46*	*65*
16	Naugatuck, Conn	115	133	112	106	115	93	59	44	40	41	25	20	18	8
		106	*150*	*103*	*126*	*118*	*112*	*55*	*47*	*39*	*39*	*38*	*16*	*18*	*11*
17	Torrington, Conn	103	140	112	104	98	110	71	73	35	.....	30	28	17	10
		98	*143*	*132*	*79*	*114*	*104*	*76*	*78*	*48*	.....	*32*	*29*	*21*	*12*
18	Wallingford, Conn	113	148	134	100	113	106	77	62	70	.....	24	16	12	7
		104	*145*	*126*	*101*	*100*	*100*	*98*	*52*	*117*	.....	*38*	*31*	*16*	*20*
19	Pensacola, Fla	165	244	129	116	90	64	29	26	15	.....	7	8	4	.....
		189	*217*	*157*	*118*	*110*	*60*	*55*	*38*	*24*	.....	*26*	*8*	*4*	*5*
20	Athens, Ga	82	151	123	143	108	74	60	42	.....	.....	38	29	26	.....
		85	*109*	*110*	*99*	*119*	*96*	*93*	*69*	.....	.....	*41*	*21*	*15*	*5*
21	Columbus, Ga	174	126	121	134	95	69	54	36	.....	.....	32	18	7	4
		194	*166*	*105*	*119*	*104*	*80*	*52*	*47*	.....	.....	*41*	*28*	*11*	*5*

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22	Dalton, Ga	59	194	139	112	102	89	62	57	.....	.....	23	17	.....	.....
		68	*142*	*130*	*123*	*100*	*58*	*65*	*69*	*8*	.....	*33*	*24*	.....	.....
23	Lagrange, Ga	65	219	138	100	117	46	43	35	.....	.....	20	11	8	.....
		65	*171*	*145*	*121*	*126*	*70*	*87*	*59*	.....	.....	*33*	*13*	*3*	.....
24	Pocatello, Idaho	60	150	123	94	114	111	84	58	46	.....	28	4	16	4
		62	*133*	*126*	*103*	*105*	*130*	*68*	*47*	*87*	.....	*25*	*20*	*9*	*4*
25	Alton, Ill	147	127	91	80	82	79	78	51	51	.....	27	17	15	11
		138	*103*	*104*	*93*	*90*	*94*	*87*	*65*	*60*	.....	*54*	*39*	*19*	*30*
26	Belleville, Ill	175	127	105	127	88	97	63	69	53	.....	24	13	14	.....
		163	*142*	*93*	*100*	*114*	*106*	*86*	*60*	*44*	.....	*21*	*18*	*15*	.....
27	Canton, Ill	93	132	124	171	127	92	79	57	48	.....	55	15	17	11
		96	*123*	*111*	*101*	*113*	*98*	*74*	*66*	*56*	.....	*53*	*24*	*30*	*21*
28	Centralia, Ill	85	159	122	1'3	122	119	77	83	53	.....	.....	.....	.....	.....
		97	*128*	*117*	*84*	*100*	*100*	*87*	*70*	*68*	.....	.....	.....	.....	.....
29	Champaign, Ill	89	159	97	118	91	102	103	70	44	.....	.....	.....	.....	.....
		87	*126*	*93*	*95*	*112*	*104*	*98*	*63*	*49*	.....	.....	.....	.....	.....
30	Chicago Heights, Ill	91	222	136	148	92	66	47	59	47	.....	.....	.....	.....	.....
		109	*165*	*98*	*94*	*52*	*55*	*44*	*38*	*50*	.....	.....	.....	.....	.....
31	Clinton, Ill	60	149	117	105	93	123	83	65	57	.....	47	35	23	23
		57	*132*	*132*	*122*	*98*	*81*	*98*	*78*	*78*	.....	*72*	*54*	*21*	*49*
32	De Kalb, Ill	80	144	99	112	74	74	89	77	64	.....	.....	.....	.....	.....
		74	*135*	*97*	*113*	*84*	*90*	*91*	*90*	*91*	.....	.....	.....	.....	.....
33	Evanston (Dist. No. 76), Ill	62	161	91	148	78	109	75	107	47	.....	.....	.....	.....	.....
		60	*126*	*107*	*161*	*94*	*85*	*68*	*85*	*67*	.....	.....	.....	.....	.....
34	Evanston (Dist. No. 75), Ill	120	173	109	131	101	97	80	84	68	.....	.....	.....	.....	.....
		114	*136*	*112*	*113*	*93*	*85*	*103*	*77*	*65*	.....	.....	.....	.....	.....
35	Freeport, Ill	135	154	101	114	120	102	76	67	54	.....	39	27	20	11
		130	*155*	*70*	*127*	*115*	*110*	*86*	*79*	*67*	.....	*48*	*48*	*31*	*37*
36	Galesburg, Ill	169	138	92	114	104	92	103	77	64	.....	63	43	32	25
		170	*127*	*104*	*108*	*91*	*100*	*93*	*91*	*68*	.....	*77*	*64*	*78*	*32*
37	Jacksonville, Ill	93	130	116	142	122	131	87	71	67	.....	42	28	28	18
		106	*110*	*131*	*95*	*116*	*109*	*103*	*89*	*41*	.....	*65*	*36*	*42*	*34*
38	Kankakee, Ill	101	129	125	116	115	103	92	83	52	.....	32	18	16	10
		102	*150*	*103*	*69*	*115*	*94*	*88*	*100*	*71*	.....	*44*	*27*	*21*	*12*
39	La Salle, Ill	97	122	103	78	65	49	40	43	40	.....	.....	.....	.....	.....
		94	*108*	*98*	*90*	*53*	*55*	*48*	*47*	*39*	.....	.....	.....	.....	.....
40	Macomb, Ill	44	156	103	135	122	104	95	61	47	.....	44	22	17	28
		46	*151*	*118*	*89*	*118*	*83*	*99*	*69*	*59*	.....	*59*	*61*	*45*	*23*
41	Mattoon, Ill	122	161	122	123	100	97	69	72	32	.....	24	18	14	9
		113	*153*	*117*	*109*	*116*	*115*	*77*	*70*	*49*	.....	*41*	*26*	*14*	*11*
42	Maywood and Melrose Park, Ill	141	111	90	114	88	80	56	58	40	.....	24	10	7	2
		111	*125*	*118*	*98*	*93*	*100*	*74*	*57*	*58*	.....	*22*	*20*	*12*	*2*
43	Moline, Ill	157	126	116	118	95	121	106	92	57	.....	40	19	17	16
		160	*109*	*97*	*121*	*92*	*100*	*88*	*93*	*56*	.....	*31*	*27*	*17*	*24*
44	Ottawa, Ill	84	137	100	97	116	91	91	78	74	.....	.....	.....	.....	.....
		83	*125*	*103*	*103*	*108*	*107*	*89*	*93*	*80*	.....	.....	.....	.....	.....
45	Pekin, Ill	91	167	115	113	94	96	76	63	49	.....	44	22	14	8
		95	*144*	*101*	*102*	*117*	*91*	*70*	*77*	*45*	.....	*35*	*27*	*28*	*19*
46	Rock Island, Ill	169	143	114	111	110	97	96	74	66	.....	33	29	23	19
		174	*113*	*115*	*108*	*104*	*101*	*103*	*80*	*71*	.....	*40*	*25*	*29*	*28*
47	Streator, Ill	134	194	99	123	101	102	72	43	.....	.....	.....	.....	.....	.....
		131	*185*	*107*	*104*	*92*	*84*	*74*	*49*	.....	.....	.....	.....	.....	.....

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TABLE 10.—*Percentage relation between the largest age group and the number found in each grade in certain cities of less than 25,000 population*—Contd.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Largest age group.	Elementary school grades.									High school years.			
			1	2	3	4	5	6	7	8	9	1	2	3	4
48	Waukegan, Ill.	113	145	117	96	100	80	84	58	68	.....	.....	.....	.....	.....
		111	*134*	*96*	*85*	*118*	*81*	*97*	*72*	*72*	.....	.....	.....	.....	.....
49	Alexandria, Ind.	42	152	105	129	112	111	63	51	48	.....	.....	.....	.....	.....
		50	*116*	*106*	*112*	*84*	*88*	*94*	*82*	*62*	.....	.....	.....	.....	.....
50	Bedford, Ind.	91	157	105	124	83	87	98	85	47	.....	.....	.....	.....	.....
		82	*168*	*77*	*108*	*97*	*98*	*73*	*87*	*59*	.....	.....	.....	.....	.....
51	Connersville, Ind.	57	130	117	100	105	81	77	55	63	.....	42	24	21	28
		60	*123*	*131*	*120*	*95*	*90*	*93*	*78*	*65*	.....	*48*	*61*	*30*	*20*
52	Crawfordsville, Ind.	74	136	111	122	92	95	78	82	67	.....	78	40	40	22
		77	*123*	*93*	*123*	*80*	*90*	*106*	*70*	*56*	.....	*91*	*36*	*40*	*37*
53	East Chicago, Ind.	104	180	109	107	122	57	45	40	28	.....	28	6	5	2
		97	*59*	*79*	*95*	*123*	*65*	*68*	*45*	*21*	.....	*20*	*10*	*4*	*4*
54	Frankfort, Ind.	99	107	137	107	125	82	86	63	75	.....	58	27	23	26
		105	*102*	*96*	*77*	*95*	*62*	*100*	*62*	*68*	.....	*52*	*34*	*13*	*28*
55	Goshen, Ind.	74	137	114	172	53	98	75	69	44	.....	104	49	31	25
		84	*101*	*83*	*89*	*75*	*70*	*84*	*64*	*71*	.....	*80*	*43*	*22*	*27*
56	Kokomo, Ind.	130	171	117	115	101	107	86	69	47	.....	51	34	26	13
		163	*140*	*111*	*93*	*100*	*92*	*82*	*62*	*46*	.....	*38*	*31*	*25*	*21*
57	Laporte, Ind.	60	115	123	73	119	77	80	65	55	.....	69	37	15	25
		55	*123*	*106*	*98*	*124*	*83*	*111*	*74*	*77*	.....	*75*	*54*	*61*	*47*
58	Lebanon, Ind.	49	143	104	106	120	78	88	80	53	.....	124	72	41	31
		57	*139*	*100*	*123*	*96*	*99*	*79*	*56*	*59*	.....	*122*	*50*	*31*	*47*
59	Logansport, Ind.	131	143	132	125	118	100	102	91	56	.....	38	37	21	12
		134	*108*	*113*	*107*	*112*	*89*	*64*	*92*	*63*	.....	*54*	*58*	*30*	*24*
60	Michigan City, Ind.	114	142	135	102	106	121	73	64	40	.....	53	22	16	.....
		107	*145*	*108*	*108*	*119*	*100*	*72*	*77*	*54*	.....	*54*	*19*	*13*	.....
61	Peru, Ind.	100	151	108	80	120	94	83	63	41	.....	43	27	26	18
		99	*133*	*121*	*73*	*93*	*102*	*81*	*71*	*38*	.....	*52*	*47*	*37*	*25*
62	Wabash, Ind.	92	69	140	84	124	116	79	68	53	.....	40	35	24	29
		89	*78*	*80*	*120*	*95*	*95*	*107*	*88*	*75*	.....	*51*	*43*	*47*	*44*
63	Clinton, Iowa.	125	108	100	137	86	109	108	67	45	.....	41	25	16	8
		132	*99*	*94*	*124*	*88*	*97*	*84*	*68*	*56*	.....	*83*	*40*	*28*	*27*
64	Creston, Iowa.	68	119	105	108	87	124	105	71	58	.....	39	42	16	20
		66	*112*	*86*	*90*	*64*	*105*	*100*	*88*	*64*	.....	*77*	*63*	*57*	*22*
65	Iowa City, Iowa.	62	193	107	109	75	83	94	89	80	.....	.....	.....	.....	.....
		71	*150*	*75*	*123*	*48*	*89*	*74*	*71*	*92*	.....	.....	.....	.....	.....
66	Keokuk, Iowa.	102	179	114	116	101	77	91	66	75	.....	37	21	13	18
		95	*154*	*109*	*111*	*101*	*103*	*117*	*69*	*98*	.....	*35*	*34*	*30*	*31*
67	Marshalltown, Iowa.	102	155	129	136	108	108	82	48	67	.....	31	25	18	18
		109	*151*	*118*	*143*	*120*	*110*	*100*	*68*	*67*	.....	*53*	*37*	*27*	*25*
68	Mason City, Iowa.	83	134	110	132	105	96	104	71	68	.....	43	35	16	11
		118	*72*	*73*	*79*	*66*	*63*	*58*	*62*	*59*	.....	*48*	*31*	*30*	*17*

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69	Muscatine, Iowa	102	119	107	79	114	119	100	78	68	25	36	26	21	13
		121	*79*	*74*	*76*	*106*	*83*	*95*	*84*	*70*	*32*	*80*	*19*	*19*	*19*
70	Oskaloosa, Iowa	98	112	105	89	116	122	92	59	48	.....	43	19	22	8
		92	*95*	*100*	*90*	*105*	*88*	*88*	*77*	*57*	.....	*46*	*44*	*23*	*12*
71	Ottumwa, Iowa	230	209	108	97	81	83	81	62	41	.....	25	22	11	6
		219	*198*	*105*	*115*	*83*	*93*	*116*	*76*	*56*	.....	*31*	*35*	*17*	*15*
72	Arkansas City, Kans	76	152	108	98	110	110	82	65	55	.....	58	21	15	13
		71	*162*	*85*	*109*	*92*	*89*	*52*	*62*	*73*	.....	*58*	*50*	*12*	*26*
73	Emporia, Kans	71	143	109	99	119	134	101	75	51	.....	85	48	21	11
		93	*106*	*102*	*115*	*93*	*76*	*101*	*77*	*47*	.....	*66*	*51*	*27*	*15*
74	Hutchinson, Kans	127	152	111	111	162	110	99	57	44	10	39	22	14	16
		112	*155*	*110*	*90*	*117*	*118*	*111*	*94*	*66*	*22*	*67*	*34*	*27*	*18*
75	Parsons, Kans	108	169	131	86	102	95	69	75	54	.....	38	17	19	6
		92	*185*	*158*	*111*	*119*	*95*	*89*	*91*	*72*	.....	*66*	*39*	*21*	*23*
76	Owensboro, Ky	88	122	112	112	118	103	107	84	70	.....	38	55	16	16
		101	*117*	*94*	*90*	*98*	*116*	*76*	*67*	*66*	.....	*68*	*44*	*21*	*29*
77	Shreveport, La	165	212	123	122	99	81	65	40	34	.....	28	20	4	5
		114	*207*	*105*	*122*	*93*	*85*	*64*	*57*	*51*	.....	*36*	*26*	*14*	*7*
78	Bangor, Me	164	207	108	96	98	76	95	41	92	24	59	26	27	31
		230	*98*	*82*	*68*	*49*	*56*	*82*	*65*	*58*	*31*	*42*	*43*	*58*	*19*
79	Waterville, Me	86	104	87	82	97	60	60	60	45	43	27	16	9	9
		70	*100*	*128*	*101*	*76*	*65*	*29*	*35*	*68*	*47*	*44*	*35*	*27*	*19*
80	Cumberland, Md	158	227	120	145	127	88	41	.....	.....	.....	41	14	9	8
		178	*205*	*121*	*150*	*107*	*101*	*59*	.....	.....	.....	*46*	*28*	*9*	*11*
81	Hagerstown, Md	139	205	111	117	94	77	51	40	.....	.....	.....	.....	.....	.....
		128	*239*	*98*	*128*	*82*	*75*	*76*	*49*	.....	.....	.....	.....	.....	.....
82	Adams, Mass	102	138	129	160	92	95	91	61	39	36	29	28	15	11
		105	*112*	*86*	*101*	*109*	*92*	*78*	*65*	*67*	*29*	*27*	*35*	*22*	*17*
83	Attleboro, Mass	126	186	128	108	115	110	75	66	54	.....	34	23	11	11
		175	*110*	*92*	*82*	*69*	*78*	*61*	*49*	*36*	.....	*28*	*18*	*15*	*10*
84	Beverly, Mass	143	134	109	120	160	125	102	95	76	57	44	27	32	16
		149	*120*	*107*	*100*	*106*	*100*	*120*	*82*	*80*	*53*	*57*	*42*	*37*	*32*
85	Danvers, Mass	85	99	97	64	112	116	84	81	66	54	55	35	24	14
		75	*107*	*86*	*87*	*166*	*94*	*107*	*90*	*87*	*32*	*66*	*47*	*30*	*42*
86	Dedham, Mass	83	133	121	107	84	108	86	67	66	56	32	44	16	26
		104	*99*	*101*	*67*	*86*	*71*	*90*	*68*	*66*	*42*	*34*	*45*	*24*	*24*
87	Framingham, Mass	126	117	80	98	79	78	84	75	92	72	58	28	22	15
		109	*137*	*92*	*88*	*104*	*98*	*107*	*90*	*74*	*74*	*37*	*36*	*26*	*32*
88	Gardner, Mass	93	155	124	125	107	95	88	68	47	.....	49	39	32	24
		90	*140*	*130*	*107*	*94*	*106*	*91*	*88*	*57*	.....	*46*	*41*	*43*	*35*
89	Marlboro, Mass	136	111	113	108	98	113	97	83	36	41	34	20	15	9
		121	*93*	*114*	*124*	*115*	*96*	*109*	*95*	*49*	*65*	*45*	*31*	*28*	*24*
90	Melrose, Mass	166	89	96	92	89	83	105	90	65	67	40	48	25	25
		149	*105*	*97*	*91*	*118*	*107*	*99*	*106*	*90*	*70*	*59*	*47*	*53*	*33*
91	Medford, Mass	197	132	97	103	99	110	110	83	80	70	58	27	20	16
		205	*130*	*94*	*93*	*94*	*114*	*100*	*81*	*80*	*68*	*54*	*23*	*24*	*20*
92	Milford, Mass	117	169	122	112	87	78	72	51	45	33	44	17	9	4
		123	*147*	*130*	*78*	*95*	*67*	*66*	*54*	*56*	*29*	*24*	*26*	*9*	*18*
93	Montague, Mass	58	143	114	92	128	105	122	90	62	.....	55	40	21	19
		59	*125*	*101*	*98*	*82*	*94*	*97*	*87*	*55*	.....	*45*	*38*	*19*	*36*
94	Natick, Mass	84	96	105	96	102	118	113	81	78	70	52	42	20	19
		99	*86*	*106*	*80*	*94*	*90*	*86*	*83*	*69*	.....	*48*	*44*	*26*	*25*

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TABLE 10.—*Percentage relation between the largest age group and the number found in each grade in certain cities of less than 25,000 population*—Contd.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Largest age group.	Elementary school grades.									High school years.			
			1	2	3	4	5	6	7	8	9	1	2	3	4
95	Newburyport, Mass	116	81	78	69	69	81	70	73	60	55	79	40	35	18
		89	*117*	*98*	*105*	*83*	*106*	*82*	*85*	*89*	*70*	*68*	*57*	*44*	*41*
96	North Attleboro, Mass	73	173	116	129	95	84	80	54	57	56	16	15	21	9
		84	*127*	*78*	*89*	*77*	*80*	*71*	*61*	*41*	*48*	*31*	*39*	*15*	*20*
97	Norwood, Mass	80	144	115	98	88	108	109	70	81	58	53	23	6	9
		94	*101*	*110*	*87*	*91*	*87*	*117*	*66*	*58*	*52*	*51*	*33*	*10*	*14*
98	Northbridge, Mass	86	98	140	118	108	88	99	67	63	.....	25	12	13	6
		87	*80*	*127*	*110*	*100*	*83*	*75*	*65*	*50*	.....	*45*	*20*	*16*	*7*
99	Peabody, Mass	113	146	92	80	100	92	95	91	75	58	38	24	17	20
		105	*158*	*86*	*90*	*98*	*107*	*95*	*80*	*56*	*58*	*36*	*26*	*19*	*20*
100	Revere, Mass	182	121	104	97	91	76	87	76	72	68	9	23	34	17
		160	*113*	*122*	*94*	*94*	*82*	*98*	*75*	*66*	*66*	*13*	*29*	*42*	*15*
101	Wakefield, Mass	115	119	77	89	104	105	89	93	67	56	48	43	35	20
		118	*105*	*98*	*83*	*84*	*97*	*76*	*99*	*61*	*53*	*62*	*32*	*38*	*38*
102	Westfield, Mass	114	109	107	103	96	111	76	88	30	.....	50	37	25	12
		108	*141*	*89*	*130*	*110*	*98*	*92*	*100*	*40*	.....	*73*	*68*	*40*	*32*
103	West Springfield, Mass	111	136	93	102	97	82	79	55	40	29	19	21	18	15
		95	*154*	*90*	*98*	*87*	*99*	*90*	*87*	*54*	*47*	*33*	*27*	*26*	*18*
104	Weymouth, Mass	115	134	81	93	120	102	132	86	69	64	38	50	18	9
		114	*105*	*62*	*99*	*123*	*86*	*183*	*69*	*65*	*50*	*37*	*46*	*29*	*21*
105	Winchester (town), Mass	90	116	161	78	113	99	93	89	64	46	35	36	30	12
		104	*93*	*98*	*99*	*78*	*80*	*79*	*70*	*60*	*38*	*43*	*31*	*30*	*19*
106	Winthrop, Mass	84	136	109	120	96	116	115	77	69	77	52	38	14	10
		85	*113*	*103*	*97*	*98*	*100*	*68*	*107*	*68*	*87*	*52*	*37*	*19*	*19*
107	Woburn, Mass	169	110	99	96	106	120	105	90	65	36	49	27	16	8
		140	*139*	*122*	*100*	*113*	*126*	*104*	*55*	*52*	*43*	*56*	*37*	*23*	*20*
108	Ann Arbor, Mich	100	180	98	124	100	112	87	101	75	.....	97	59	52	107
		98	*190*	*69*	*85*	*117*	*86*	*108*	*90*	*101*	.....	*108*	*79*	*61*	*51*
109	Cadillac, Mich	100	133	120	93	108	70	81	81	56	.....	37	19	31	10
		104	*117*	*97*	*87*	*75*	*80*	*99*	*63*	*81*	.....	*49*	*39*	*30*	*9*
110	Cheboygan, Mich	67	214	118	116	91	95	69	48	36	.....	35	15	14	2
		66	*179*	*103*	*100*	*95*	*77*	*87*	*61*	*55*	.....	*54*	*34*	*21*	*17*
111	Escanaba, Mich	110	157	105	91	101	109	91	95	74	.....	66	51	19	20
		116	*145*	*100*	*95*	*80*	*93*	*77*	*96*	*66*	.....	*76*	*55*	*36*	*25*
112	Hancock, Mich	81	218	139	60	71	71	54	62	28	.....	28	33	20	18
		63	*265*	*161*	*74*	*58*	*47*	*61*	*69*	*52*	.....	*13*	*53*	*20*	*19*
113	Holland, Mich	81	141	121	107	120	120	100	94	50	.....	35	15	11	8
		101	*98*	*96*	*122*	*107*	*90*	*76*	*85*	*61*	.....	*49*	*16*	*14*	*9*
114	Iron Mountain, Mich	124	88	120	97	122	109	84	84	47	.....	39	26	12	6
		113	*103*	*109*	*111*	*119*	*96*	*103*	*80*	*58*	.....	*46*	*19*	*17*	*9*

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115	Ironwood, Mich	116	129	140	120	99	97	75	46	64	.....	38	28	13	13
		119	*146*	*110*	*107*	*98*	*100*	*67*	*47*	*47*	.....	*43*	*28*	*11*	*10*
116	Ishpeming, Mich	141	120	86	60	95	96	94	59	82	.....	54	32	17	18
		123	*121*	*100*	*100*	*94*	*100*	*91*	*82*	*85*	.....	*60*	*54*	*27*	*42*
117	Lansing, Mich	174	157	134	106	129	100	88	75	45	.....	59	24	17	16
		181	*157*	*102*	*110*	*109*	*96*	*82*	*74*	*60*	.....	*65*	*30*	*25*	*15*
118	Marquette, Mich	100	177	116	121	103	100	79	69	71	.....	41	24	13	14
		90	*181*	*117*	*122*	*98*	*83*	*89*	*83*	*83*	.....	*60*	*35*	*32*	*13*
119	Menominee, Mich	118	138	135	100	109	76	72	76	50	.....	48	23	4	4
		100	*130*	*102*	*115*	*101*	*73*	*87*	*103*	*67*	.....	*63*	*46*	*16*	*14*
120	Muskegon, Mich	176	132	110	114	111	116	99	97	19	.....	40	31	22	27
		179	*143*	*117*	*96*	*120*	*114*	*102*	*92*	*19*	.....	*53*	*49*	*23*	*28*
121	Sault Ste. Marie, Mich	111	197	94	90	110	88	79	68	42	.....	54	22	15	10
		129	*158*	*87*	*86*	*82*	*86*	*59*	*54*	*35*	.....	*31*	*29*	*17*	*10*
122	Meridian, Miss	155	214	134	105	79	77	59	47	30	.....	34	23	10	1
		151	*262*	*148*	*140*	*103*	*111*	*78*	*84*	*78*	.....	*38*	*50*	*19*	*12*
123	Carthage, Mo	90	164	122	120	131	80	96	89	42	.....	67	24	24	15
		91	*132*	*114*	*92*	*102*	*106*	*102*	*87*	*83*	.....	*88*	*64*	*27*	*21*
124	Great Falls, Mont	128	157	100	128	107	102	83	71	52	.....	27	36	18	13
		131	*112*	*118*	*112*	*96*	*93*	*79*	*76*	*68*	.....	*59*	*32*	*24*	*25*
125	Concord, N. H	114	170	108	118	115	121	64	93	85	.....	78	54	26	12
		117	*136*	*122*	*119*	*121*	*111*	*75*	*108*	*91*	.....	*65*	*47*	*48*	*37*
126	Portsmouth, N. H	84	139	114	79	79	93	75	76	66	.....	75	41	29	14
		81	*151*	*133*	*108*	*82*	*105*	*81*	*72*	*78*	.....	*87*	*49*	*21*	*28*
127	Bloomfield, N. J	121	126	97	106	93	115	79	51	43	.....	33	28	6	6
		120	*95*	*95*	*88*	*94*	*89*	*91*	*75*	*53*	.....	*41*	*26*	*13*	*19*
128	Bridgeton, N. J	100	167	163	114	127	95	70	72	48	.....	36	25	22	12
		101	*155*	*115*	*119*	*106*	*99*	*97*	*78*	*67*	.....	*39*	*34*	*35*	*22*
129	Garfield, N. J	88	214	123	105	82	61	53	18	25	.....	.....	.....	.....	.....
		100	*185*	*103*	*94*	*48*	*68*	*49*	*12*	*10*	.....	.....	.....	.....	.....
130	Kearny, N. J	158	191	105	108	107	97	77	66	42	.....	22	15	7	7
		146	*204*	*108*	*114*	*109*	*94*	*88*	*79*	*31*	.....	*32*	*21*	*13*	*11*
131	Long Branch, N. J	119	106	115	116	121	136	68	67	35	.....	62	29	21	13
		123	*129*	*109*	*114*	*103*	*118*	*92*	*74*	*49*	.....	*46*	*29*	*15*	*17*
132	Irvington, N. J	93	152	135	133	126	107	76	54	54	.....	29	8	4	3
		104	*114*	*132*	*106*	*93*	*74*	*82*	*61*	*29*	.....	*41*	*7*	*4*	*2*
133	Montclair, N. J	159	139	108	119	105	111	65	64	61	.....	72	38	31	23
		127	*154*	*133*	*114*	*111*	*118*	*110*	*129*	*77*	.....	*75*	*2*	*51*	*33*
134	Morristown, N. J	75	158	109	105	118	117	83	80	52	.....	33	23	15	13
		75	*126*	*95*	*111*	*93*	*103*	*84*	*62*	*56*	.....	*46*	*28*	*29*	*22*
135	Plainfield, N. J	137	132	109	139	97	109	113	64	42	.....	49	26	21	18
		138	*128*	*116*	*123*	*108*	*96*	*98*	*73*	*50*	.....	*53*	*43*	*23*	*11*
136	Town of Union, N. J	168	135	128	131	141	119	69	29	24	.....	41	35	24	11
		179	*118*	*115*	*129*	*117*	*107*	*61*	*36*	*33*	.....	*33*	*25*	*12*	*11*
137	Vineland, N. J	101	154	126	117	98	109	58	39	35	.....	29	15	8	9
		89	*150*	*115*	*120*	*93*	*94*	*65*	*63*	*50*	.....	*50*	*23*	*23*	*10*
138	West New York, N. J	137	163	129	109	118	89	62	36	21	.....	.....	.....	.....	.....
		139	*152*	*107*	*118*	*134*	*92*	*74*	*28*	*35*	.....	.....	.....	.....	.....
139	West Orange, N. J	92	184	116	131	123	81	48	35	19	.....	17	21	7	6
		85	*177*	*121*	*102*	*102*	*78*	*73*	*49*	*31*	.....	*25*	*11*	*13*	*8*
140	Albuquerque, N. Mex	79	236	116	119	112	98	102	46	44	.....	28	15	14	4
		85	*162*	*117*	*97*	*96*	*104*	*75*	*55*	*38*	.....	*38*	*21*	*8*	*17*

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TABLE 10.—*Percentage relation between the largest age group and the number found in each grade in certain cities of less than 25,000 population*—Contd.

[Throughout this table the figures that represent girls are printed in italics.]

	Cities.	Largest age group.	Elementary school grades.									High school years.			
			1	2	3	4	5	6	7	8	9	1	2	3	4
141	Amsterdam, N. Y.	157	154	149	107	118	93	82	48	16	.....	.....	.....	.....	.....
		162	*129*	*152*	*114*	*98*	*103*	*95*	*65*	*24*	.....	.....	.....	.....	.....
142	Dunkirk, N. Y.	103	152	113	89	103	78	87	71	61	.....	44	37	7	10
		140	*114*	*81*	*66*	*69*	*61*	*49*	*51*	*50*	.....	*19*	*23*	*24*	*9*
143	Gloversville, N. Y.	155	112	117	129	114	97	95	79	31	.....	52	28	25	5
		147	*105*	*106*	*120*	*92*	*92*	*103*	*80*	*31*	.....	*76*	*31*	*29*	*9*
144	Johnstown, N. Y.	87	129	110	112	106	69	88	79	64	.....	53	22	10	1
		83	*152*	*92*	*100*	*92*	*95*	*69*	*69*	*65*	.....	*54*	*29*	*16*	*23*
145	New Rochelle, N. Y.	250	176	164	109	102	62	55	57	36	.....	31	14	13	5
		192	*179*	*178*	*136*	*117*	*75*	*65*	*71*	*49*	.....	*31*	*18*	*9*	*9*
146	Olean, N. Y.	127	95	89	112	92	119	77	69	71	.....	41	25	23	18
		116	*113*	*109*	*103*	*104*	*105*	*104*	*58*	*75*	.....	*59*	*39*	*29*	*24*
147	Port Chester, N. Y.	113	176	109	81	109	78	83	81	46	.....	31	22	11	8
		123	*162*	*97*	*73*	*89*	*79*	*77*	*79*	*29*	.....	*36*	*16*	*14*	*9*
148	White Plains, N. Y.	120	89	94	102	101	79	71	47	37	.....	39	24	18	9
		103	*84*	*107*	*114*	*119*	*99*	*92*	*99*	*57*	.....	*67*	*47*	*19*	*16*
149	Asheville, N. C.	172	268	146	111	73	75	47	38	.....	.....	.....	.....	.....	.....
		177	*195*	*149*	*117*	*83*	*78*	*51*	*61*	.....	.....	.....	.....	.....	.....
150	New Bern, N. C.	62	308	108	121	82	74	58	31	.....	.....	.....	.....	.....	.....
		86	*263*	*121*	*102*	*71*	*91*	*63*	*24*	.....	.....	.....	.....	.....	.....
151	Alliance, Ohio	141	146	95	97	97	83	89	76	61	.....	51	19	19	.....
		141	*149*	*105*	*98*	*87*	*78*	*88*	*72*	*68*	.....	*39*	*41*	*21*	.....
152	Newark, Ohio	192	133	118	121	105	111	71	76	55	.....	32	24	17	18
		191	*97*	*91*	*114*	*99*	*107*	*88*	*64*	*43*	.....	*49*	*37*	*26*	*25*
153	Norwood, Ohio	92	121	123	104	117	90	92	66	48	.....	46	13	15	7
		89	*108*	*105*	*124*	*107*	*79*	*105*	*98*	*65*	.....	*51*	*31*	*34*	*29*
154	Portsmouth, Ohio	180	155	128	147	124	111	80	70	42	.....	42	17	12	6
		215	*123*	*103*	*104*	*106*	*96*	*61*	*47*	*45*	.....	*26*	*13*	*13*	*9*
155	Sidney, Ohio	57	183	88	102	85	74	83	67	65	.....	69	55	53	32
		70	*103*	*85*	*99*	*91*	*102*	*69*	*67*	*45*	.....	*45*	*41*	*39*	*39*
156	Steubenville, Ohio	141	209	141	129	115	101	58	63	32	.....	41	11	6	13
		138	*226*	*123*	*141*	*105*	*86*	*92*	*71*	*41*	.....	*29*	*23*	*15*	*8*
157	Enid, Okla.	104	141	94	108	145	125	63	69	56	.....	48	12	15	3
		101	*124*	*72*	*125*	*117*	*131*	*97*	*82*	*87*	.....	*74*	*34*	*33*	*12*
158	McAlester, Okla.	63	221	151	161	121	74	89	35	.....	.....	44	13	7	6
		61	*205*	*128*	*148*	*101*	*81*	*96*	*64*	.....	.....	*58*	*35*	*32*	*19*
159	Beaver Falls, Pa.	103	108	102	125	116	81	65	56	22	.....	22	14	7	10
		83	*151*	*113*	*134*	*97*	*104*	*79*	*76*	*47*	.....	*39*	*34*	*19*	*14*
160	Carbondale, Pa.	153	132	121	127	98	91	81	58	55	.....	35	21	15	5
		161	*136*	*106*	*109*	*96*	*92*	*59*	*62*	*63*	.....	*51*	*36*	*21*	*5*
161	Carlisle, Pa.	92	106	124	94	90	99	72	80	56	.....	51	25	20	12
		100	*100*	*99*	*92*	*96*	*98*	*80*	*66*	*43*	.....	*46*	*33*	*29*	*17*

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162	Charleroi, Pa.	105	191	101	159	131	46	44	21	17	.....	16	3	7	.....
		96	*195*	*101*	*165*	*158*	*69*	*58*	*32*	*27*	.....	*18*	*11*	*6*	.....
163	Clearfield, Pa.	66	123	158	109	105	144	94	49	47	.....	44	28	15	7
		73	*100*	*121*	*84*	*91*	*141*	*71*	*45*	*44*	.....	*49*	*34*	*12*	*15*
164	Columbia, Pa.	93	144	105	111	131	111	65	69	48	42	26	17	8	11
		106	*112*	*96*	*109*	*109*	*69*	*61*	*49*	*32*	.....	*19*	*26*	*16*	*12*
165	Donora, Pa.	70	198	114	98	119	80	67	23	13	.....	11	7	3	.....
		81	*187*	*93*	*87*	*66*	*72*	*40*	*35*	*14*	.....	*20*	*13*	*9*	.....
166	Franklin, Pa.	69	144	124	86	84	83	94	74	89	.....	52	32	20	23
		79	*100*	*102*	*111*	*83*	*69*	*80*	*84*	*75*	.....	*66*	*39*	*33*	*23*
167	Homestead, Pa.	112	144	144	119	94	83	83	49	34	.....	32	25	14	8
		121	*175*	*110*	*104*	*76*	*54*	*57*	*40*	*31*	.....	*49*	*18*	*12*	*18*
168	Lebanon, Pa.	153	148	124	105	114	93	89	68	52	44	23	17	16	12
		152	*139*	*112*	*106*	*104*	*93*	*80*	*67*	*59*	*43*	*38*	*31*	*18*	*15*
169	Mahanoy City, Pa.	157	147	138	128	115	68	25	30	24	.....	12	9	8	7
		155	*130*	*164*	*121*	*128*	*70*	*37*	*31*	*42*	.....	*19*	*20*	*10*	*6*
170	North Braddock, Pa.	132	158	184	142	99	62	45	36	8	.....	.....	.....	.....	.....
		135	*160*	*163*	*135*	*85*	*64*	*67*	*37*	*12*	.....	.....	.....	.....	.....
171	Plymouth, Pa.	152	168	146	68	125	74	26	60	16	.....	15	6	8	.....
		145	*160*	*167*	*75*	*109*	*48*	*52*	*43*	*27*	.....	*11*	*10*	*6*	.....
172	Pottstown, Pa.	137	112	103	111	96	124	87	68	56	.....	48	37	24	12
		132	*115*	*100*	*102*	*118*	*103*	*90*	*69*	*67*	.....	*39*	*37*	*24*	*24*
173	Sharon, Pa.	112	130	124	120	119	100	90	66	69	.....	50	25	25	15
		111	*126*	*124*	*103*	*103*	*106*	*90*	*81*	*63*	.....	*52*	*38*	*39*	*12*
174	Sunbury, Pa.	117	155	136	107	100	92	90	60	50	50	43	27	15	10
		123	*122*	*118*	*108*	*102*	*86*	*63*	*82*	*54*	*35*	*41*	*24*	*22*	*13*
175	Warren, Pa.	99	200	92	114	114	85	88	83	71	26	53	26	17	10
		102	*154*	*97*	*112*	*97*	*100*	*96*	*89*	*56*	*27*	*50*	*21*	*16*	*20*
176	Central Falls, R. I.	92	151	112	112	100	103	71	52	27	34	36	20	17	3
		94	*158*	*99*	*75*	*80*	*86*	*82*	*58*	*46*	*43*	*35*	*9*	*13*	*10*
177	Spartanburg, S. C.	164	213	96	82	74	60	54	35	.....	.....	.....	.....	.....	.....
		173	*201*	*134*	*153*	*75*	*57*	*45*	*48*	.....	.....	.....	.....	.....	.....
178	Beaumont, Tex.	174	215	138	95	74	59	40	27	.....	.....	30	10	9	5
		166	*228*	*115*	*123*	*102*	*66*	*64*	*63*	.....	.....	*47*	*23*	*18*	*15*
179	Ogden, Utah	234	167	151	130	110	103	86	76	53	.....	23	20	20	14
		236	*146*	*125*	*115*	*105*	*109*	*102*	*85*	*75*	*52*	*30*	*30*	*23*	*16*
180	Everett, Wash.	181	130	113	72	105	118	72	93	85	.....	39	24	12	11
		194	*135*	*93*	*62*	*94*	*118*	*77*	*95*	*89*	.....	*50*	*30*	*17*	*14*
181	Clarksburg, W. Va.	118	166	107	95	106	96	55	48	34	.....	29	21	11	8
		100	*172*	*116*	*118*	*89*	*85*	*64*	*68*	*40*	.....	*40*	*31*	*17*	*16*
182	Appleton, Wis.	97	144	123	127	105	104	92	70	52	.....	67	47	30	29
		100	*146*	*113*	*131*	*109*	*87*	*79*	*60*	*61*	.....	*64*	*45*	*29*	*28*
183	Beloit, Wis.	127	148	104	115	114	109	111	81	66	.....	51	18	23	14
		126	*147*	*111*	*129*	*102*	*104*	*96*	*79*	*60*	.....	*84*	*33*	*40*	*32*
184	Fond du Lac, Wis.	124	139	119	114	112	88	86	58	72	.....	56	36	35	20
		152	*127*	*94*	*99*	*90*	*100*	*79*	*65*	*64*	.....	*52*	*35*	*31*	*20*
185	Marinette, Wis.	117	154	142	100	107	122	113	77	72	.....	63	38	36	14
		136	*108*	*113*	*114*	*106*	*120*	*86*	*83*	*82*	.....	*54*	*41*	*25*	*22*
186	Wausau, Wis.	145	224	104	98	88	73	88	66	51	.....	56	30	21	8
		144	*206*	*107*	*80*	*102*	*75*	*87*	*70*	*55*	.....	*58*	*38*	*22*	*12*

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From Tables 5 and 6, which give the number of pupils over age and the number of pupils under age, other tables have been made showing the different percentages of the total number of the boys and girls in any one system who were over age or under age. It is assumed in the interpretation which is given of the following tables that a census taken on one day correctly represents the situation in the schools with regard to the number of each age in each grade; that, while somewhat larger gross numbers would have been found in each case, if the number belonging had been taken, the ratio of these numbers would remain practically unchanged. The census rather than the number belonging was used in order to avoid the varying interpretation given to the unit "number belonging."

TABLE 11.—*Frequency of different percentages of total number of boys of normal age in certain cities of 25,000 population and over.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
26	2	44	6	62	10
28	0	46	2	64	6
30	2	48	7	66	5
32	1	50	9	68	3
34	1	52	8	70	4
36	0	54	17	72	2
38	4	56	12		
40	3	58	16		133
42	0	60	13		

TABLE 12.—*Frequency of different percentages of total number of girls of normal age in certain cities of 25,000 population and over.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
26	1	46	5	66	6
28	0	48	5	68	10
30	2	50	4	70	5
32	1	52	6	72	5
34	2	54	11	74	4
36	0	56	9	76	2
38	0	58	11		
40	0	60	12		133
42	3	62	8		
44	3	64	18		

TABLE 13.—*Frequency of different percentages of total number of boys of normal age in certain cities of less than 25,000 population.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
26	1	46	5	66	10
28	0	48	6	68	3
30	2	50	22	70	2
32	0	52	19	72	2
34	1	54	22	74	1
36	5	56	20	76	1
38	0	58	17	78	0
40	3	60	11	88	1
42	2	62	14		
44	4	64	12		186

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TABLE 14.—*Frequency of different percentages of total number of girls of normal age in certain cities of less than 25,000 population.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
28	1	50	13	72	5
30	0	52	8	74	5
32	2	54	14	76	1
34	0	56	14	78	1
36	1	58	16	80	2
38	0	60	13	82	1
40	3	62	13	88	1
42	6	64	11		
44	2	66	17		186
46	3	68	15		
48	9	70	9		

TABLE 15.—*Frequency of different percentages of total number of boys retarded one year in certain cities of 25,000 population and over.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
8	2	18	12	27	4
9	4	19	15	28	2
10	3	20	9	29	1
12	6	21	17	30	1
13	3	22	15	31	2
14	4	23	8		
15	6	24	4		133
16	4	25	1		
17	6	26	4		

TABLE 16.—*Frequency of different percentages of total number of girls retarded one year in certain cities of 25,000 population and over.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
6	1	16	5	26	1
7	2	17	11	27	6
8	3	18	9	28	1
9	4	19	9	29	2
10	1	20	11	31	2
11	9	21	13	34	1
12	5	22	9		
13	1	23	7		133
14	8	24	1		
15	8	25	4		

TABLE 17.—*Frequency of different percentages of total number of boys retarded one year in certain cities of less than 25,000 population.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
3	1	15	7	25	5
6	1	16	8	26	7
7	3	17	10	27	3
8	9	18	15	28	2
9	1	19	15	29	1
10	2	20	26	32	1
11	2	21	15	33	1
12	5	22	14		
13	4	23	10		186
14	8	24	10		

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TABLE 18.—*Frequency of different percentages of total number of girls retarded one year in certain cities of less than 25,000 population.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
3	1	13	9	23	6
4	2	14	8	24	6
5	3	15	11	25	10
6	4	16	17	26	2
7	6	17	10	27	4
8	2	18	13	28	2
9	2	19	16	30	3
10	4	20	13	32	1
11	5	21	11		
12	7	22	8		186

TABLE 19.—*Frequency of the different percentages of boys retarded two years in certain cities of 25,000 population and over.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
2	1	10	12	18	7
3	5	11	12	19	1
4	3	12	19	20	2
5	7	13	11	21	1
6	7	14	9	22	1
7	4	15	2		
8	9	16	2		133
9	16	17	1		

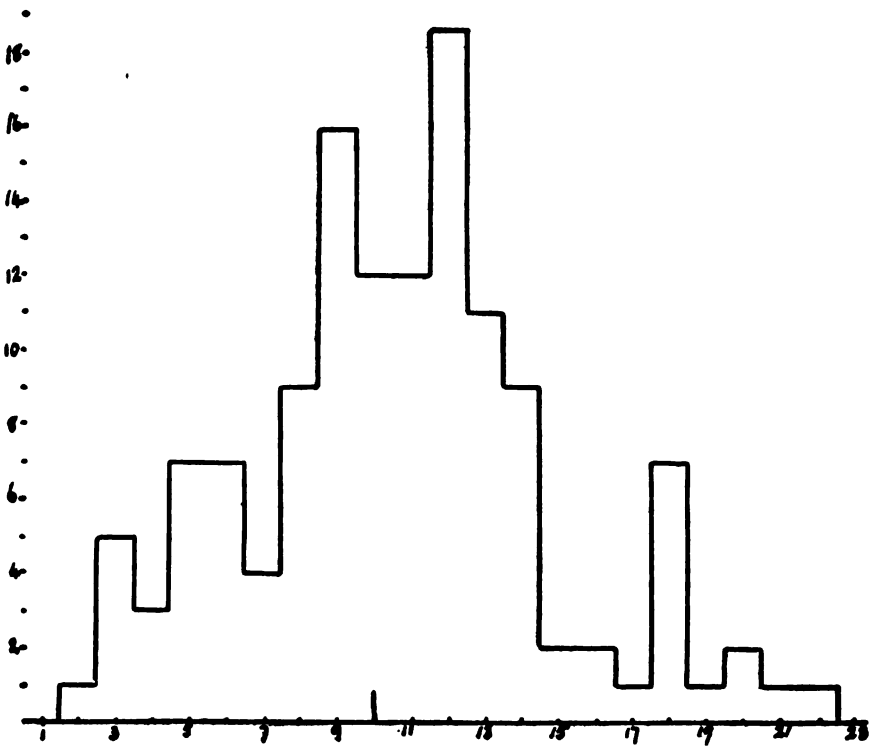

FIGURE 2.—A graphic representation of the data contained in Table 19. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.[1]

[1] In some figures the upper extremes on the horizontal scale are not represented. The position of the median is indicated by a long unit line on the horizontal scale.

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TABLE 20.—*Frequency of the different percentages of girls retarded two years in certain cities of 25,000 population and over.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
2	3	9	15	16	3
3	6	10	13	17	3
4	9	11	11	18	2
5	9	12	7	19	2
6	9	13	3	21	1
7	12	14	2		
8	18	15	5		133

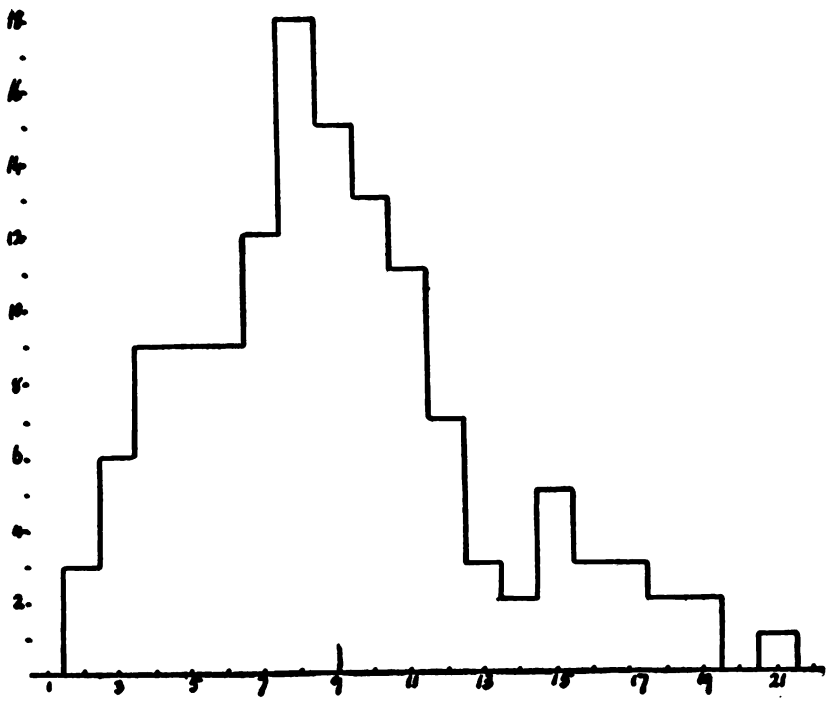

FIGURE 3.—A graphic representation of the data contained in Table 20. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 21.—*Frequency of the different percentages of boys retarded two years in certain cities of less than 25,000 population.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
2	6	10	16	18	1
3	8	11	25	19	1
4	4	12	19	20	3
5	8	13	16	21	1
6	9	14	12	22	1
7	18	15	8		
8	8	16	7		186
9	11	17	3		

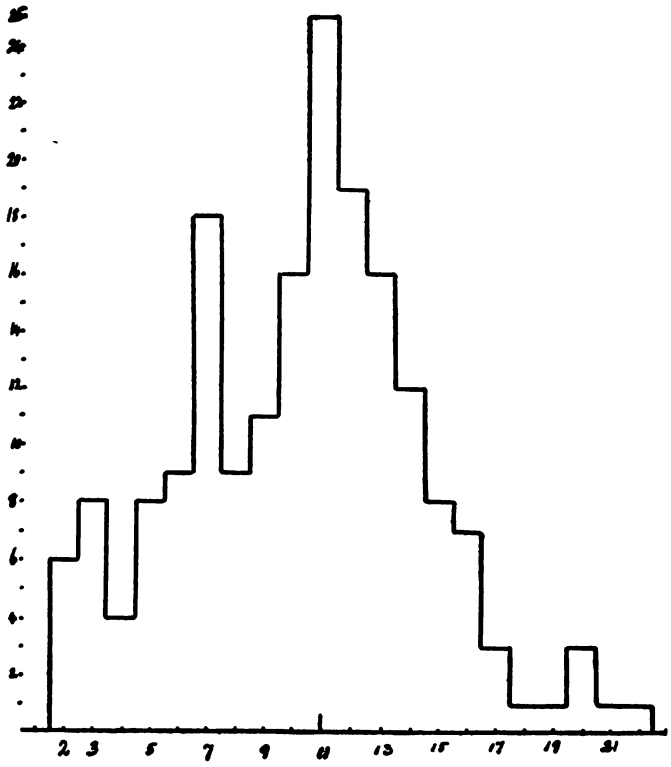

FIGURE 4.—A graphic representation of the data contained in Table 21. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 22.—*Frequency of the different percentages of girls retarded two years in certain cities of less than 25,000 population.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
1	4	8	28	15	2
2	11	9	13	16	3
3	7	10	18	17	2
4	10	11	11	18	8
5	14	12	8	20	1
6	23	13	8		
7	9	14	6		186

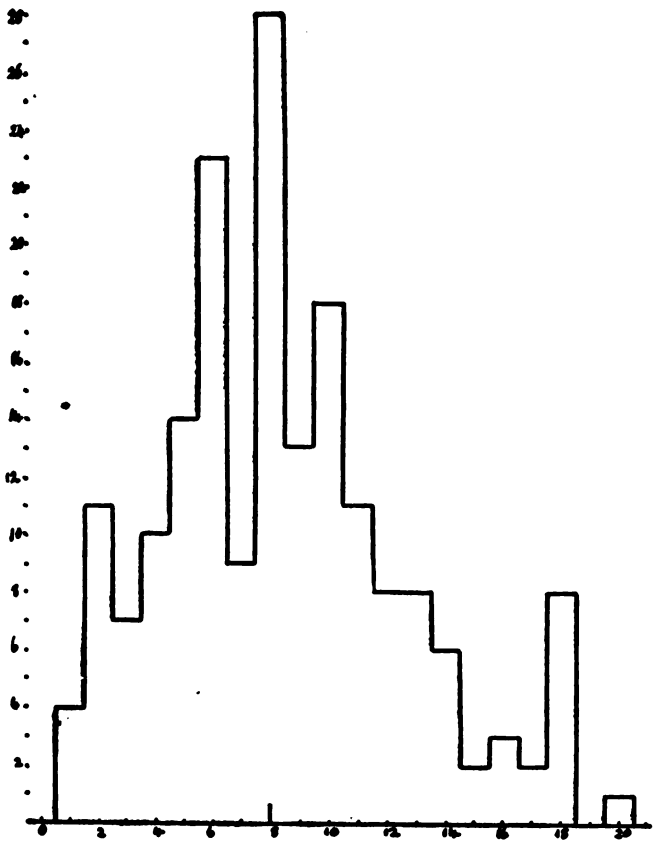

FIGURE 5.—A graphic representation of the data contained in Table 22. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 23.—*Frequency of the different percentages of boys retarded three years in certain cities of 25,000 population and over.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
1	8	7	12	13	2
2	17	8	5	15	1
3	14	9	1		
4	18	10	1		133
5	30	11	5		
6	18	12	1		

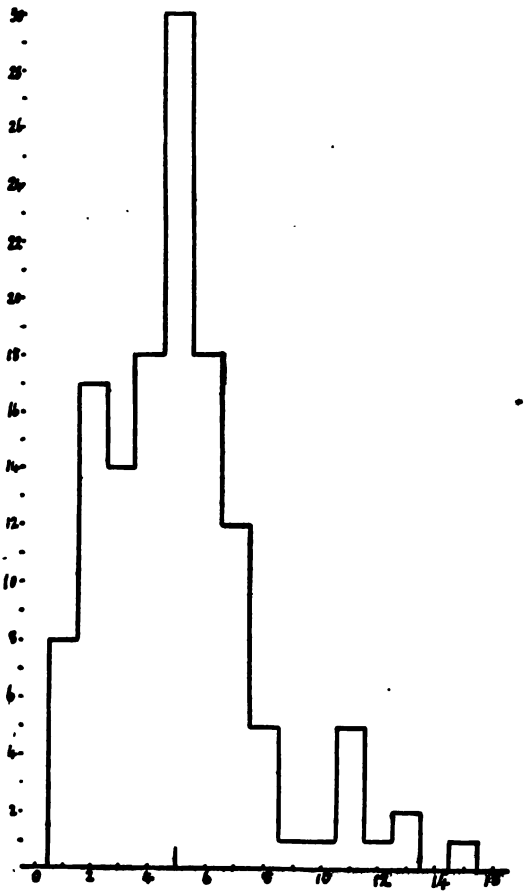

FIGURE 6.—A graphic representation of the data contained in Table 23. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 24.—*Frequency of the different percentages of girls retarded three years in certain cities of 25,000 population and over.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
1	17	6	5	12	2
2	28	7	5	14	1
3	27	8	2	17	1
4	23	9	3		
5	16	10	3		133

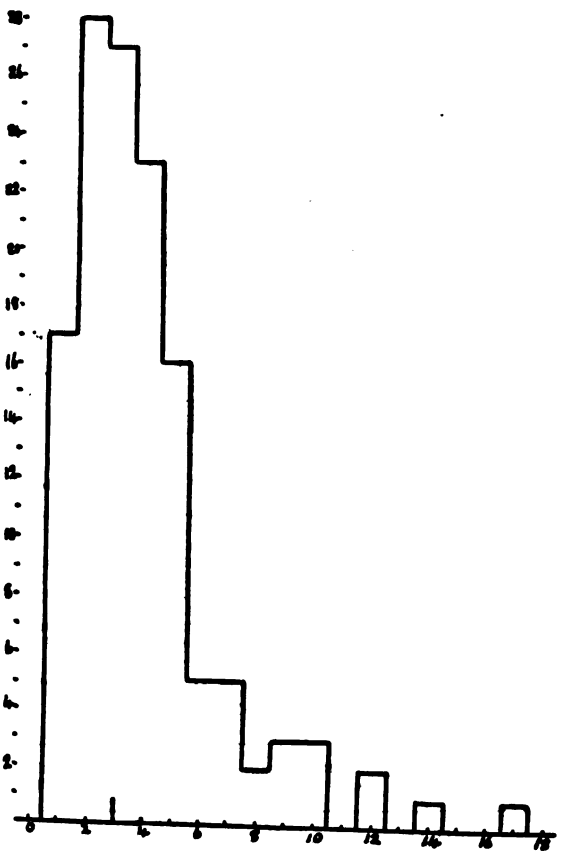

FIGURE 7.—A graphic representation of the data contained in Table 24. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 25.—*Frequency of the different percentages of boys retarded three years in certain cities of less than 25,000 population.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
Less than 1	4	6	21	12	3
1	11	7	16	13	2
2	16	8	7		
3	41	9	4		186
4	37	10	6		
5	16	11	2		

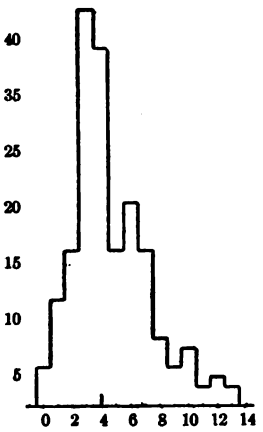

FIGURE 8.—A graphic representation of the data contained in Table 25. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

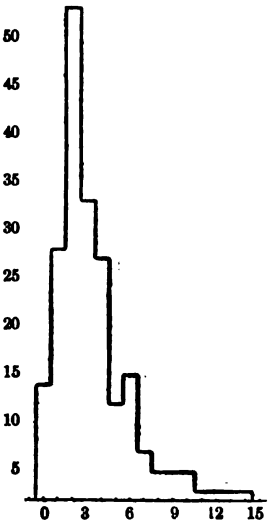

FIGURE 9.—A graphic representation of the data contained in Table 26. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 26.—*Frequency of the different percentages of girls retarded three years in certain cities of less than 25,000 population.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
Less than 1	12	6	13	12	1
1	26	7	5	13	1
2	51	8	3	14	1
3	31	9	3		
4	25	10	3		186
5	10	11	1		

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TABLE 27.—*Frequency of the different percentages of boys retarded four years or more in certain cities of 25,000 population and over.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
Less than 1	5	5	5	10	1
1	28	6	2	11	2
2	38	7	1	14	1
3	32	8	3		
4	12	9	3		133

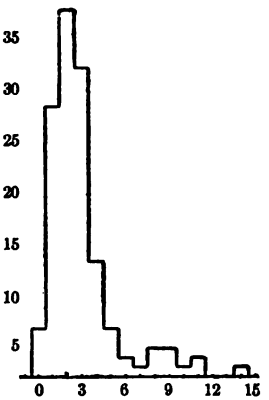

FIGURE 10.—A graphic representation of the data contained in Table 27. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

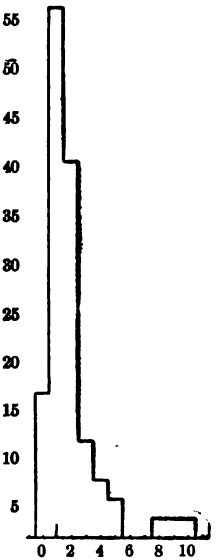

FIGURE 11.—A graphic representation of the data contained in Table 28. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 28.—*Frequency of the different percentages of girls retarded four years or more in certain cities of 25,000 population and over.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
Less than 1	15	4	6	10	2
1	55	5	4		
2	27	8	2		133
3	10	9	2		

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TABLE 29.—*Frequency of the different percentages of boys retarded four years or more in certain cities of less than 25,000 population.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
Less than 1	25	5	4	10	4
1	58	6	6	14	1
2	49	7	3	19	1
3	21	8	1		
4	10	9	3		186

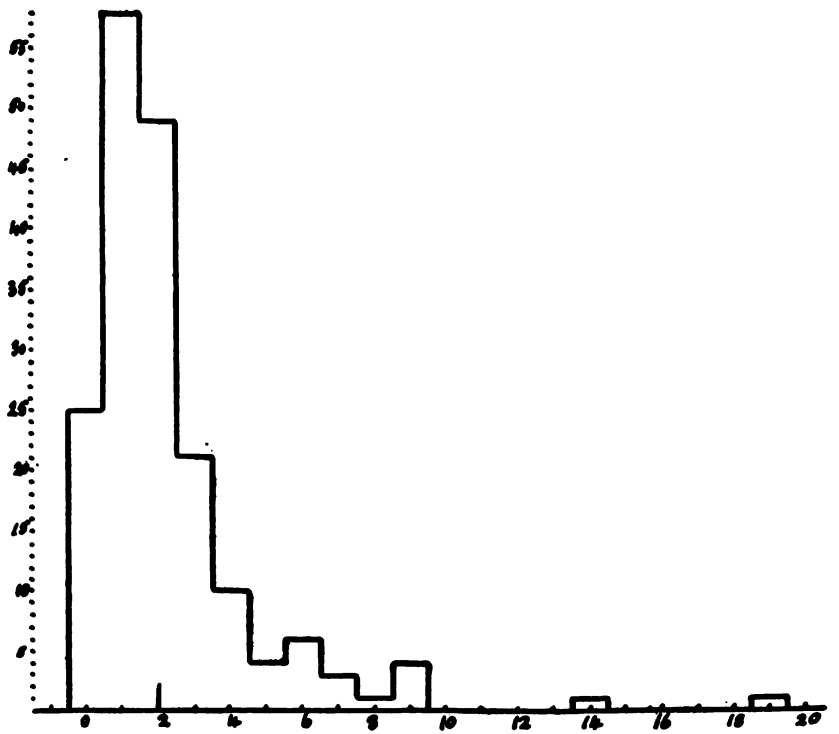

FIGURE 12.—A graphic representation of the data contained in Table 29. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 30.—*Frequency of the different percentages of girls retarded four years or more in certain cities of less than 25,000 population.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
Less than 1	45	5	3	11	2
1	70	6	2	14	1
2	25	7	2		
3	6	8	2		186
4	6	9	2		

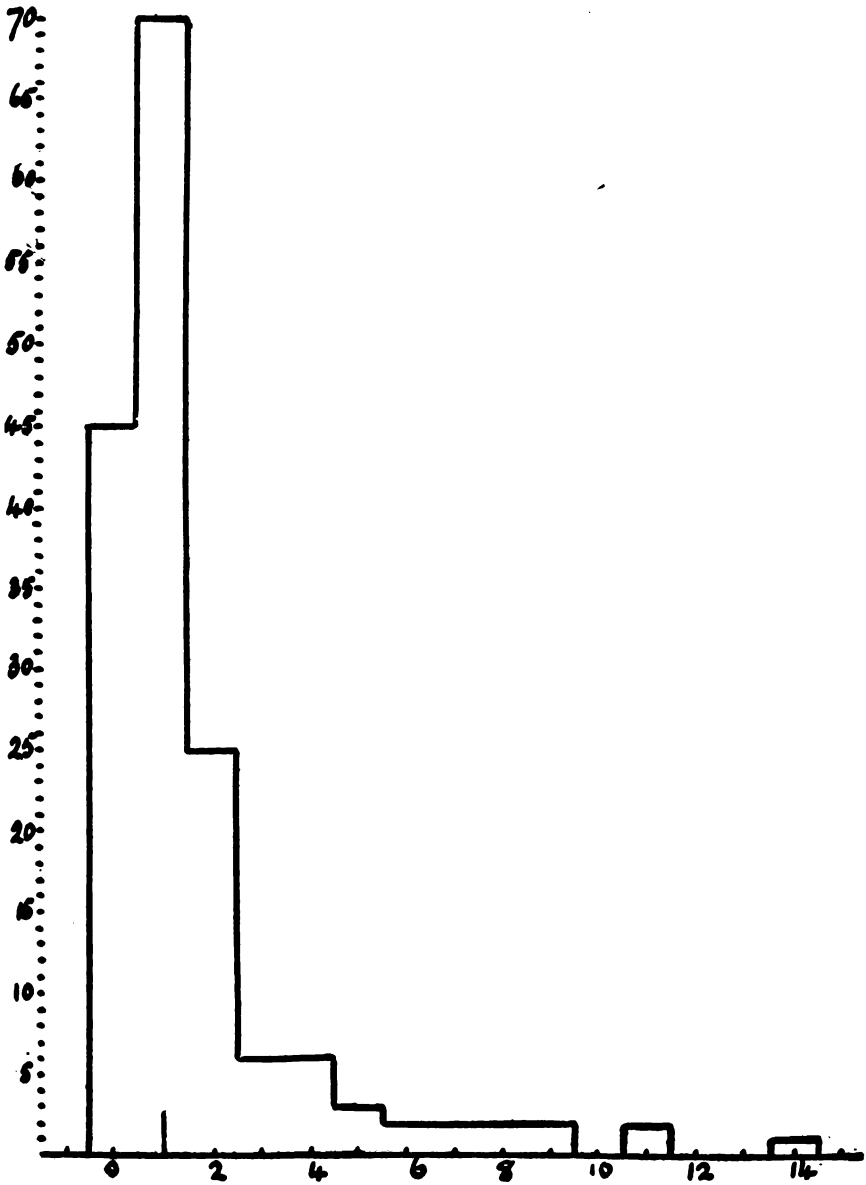

FIGURE 13.—A graphic representation of the data contained in Table 30. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 31.—*Frequency of the different percentages of boys retarded one year or more (total number retarded) in certain cities of 25,000 population and over.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
12	4	34	6	58	1
14	2	36	10	60	4
16	1	38	12	62	2
18	2	40	9	66	1
20	7	42	9	68	1
22	2	44	8	70	2
24	3	46	5	74	2
26	3	48	6		
28	7	50	2		133
30	5	52	2		
32	12	54	3		

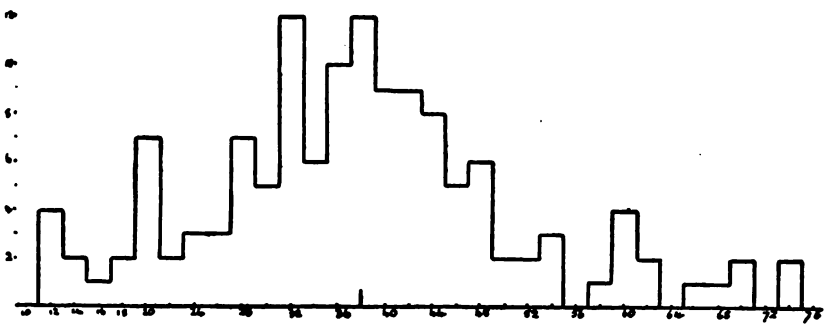

FIGURE 14.—A graphic representation of the data contained in Table 31. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 32.—*Frequency of the different percentages of girls retarded one year or more (total number retarded) in certain cities of 25,000 population and over.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
8	1	30	10	54	2
10	3	32	10	56	4
12	1	34	9	58	1
14	2	36	9	66	2
16	7	38	11	68	2
18	4	40	5	70	1
20	3	42	3	74	1
22	8	44	4		
24	4	48	3		133
26	10	50	2		
28	10	52	1		

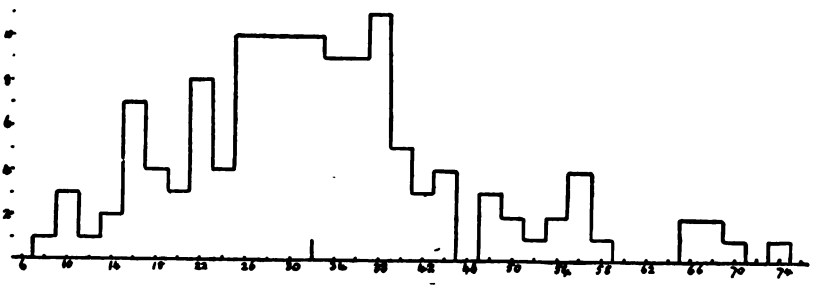

FIGURE 15.—A graphic representation of the data contained in Table 32. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 33.—*Frequency of the different percentages of boys retarded one year or more (total number retarded) in certain cities of less than 25,000 population.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
8	2	32	14	54	2
10	5	34	11	56	3
12	5	36	13	58	1
14	3	38	14	60	2
18	3	40	7	62	2
20	2	42	14	64	4
22	3	44	13	70	2
24	5	46	7	72	1
26	11	48	12		
28	10	50	6		186
30	6	52	3		

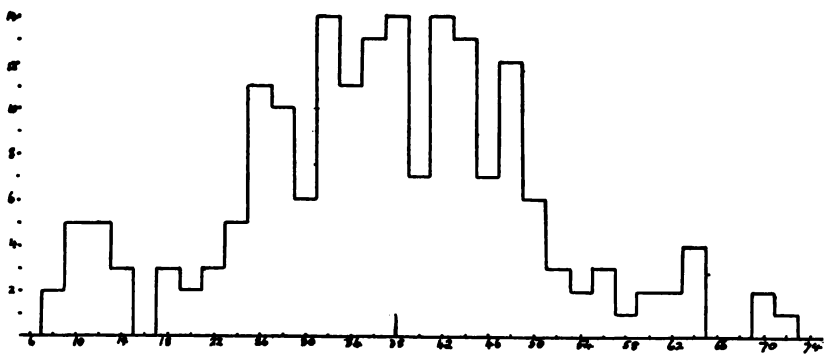

FIGURE 16.—A graphic representation of the data contained in Table 33. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 34.—*Frequency of the different percentages of girls retarded one year or more (total number retarded) in certain cities of less than 25,000 population.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
6	2	30	9	54	1
8	8	32	11	56	1
10	4	34	9	58	6
12	2	36	8	60	1
14	5	38	11	64	1
16	4	40	13	66	1
18	6	42	6	68	1
20	9	44	6	70	1
22	12	46	3		
24	10	48	3		186
26	15	50	3		
28	13	52	1		

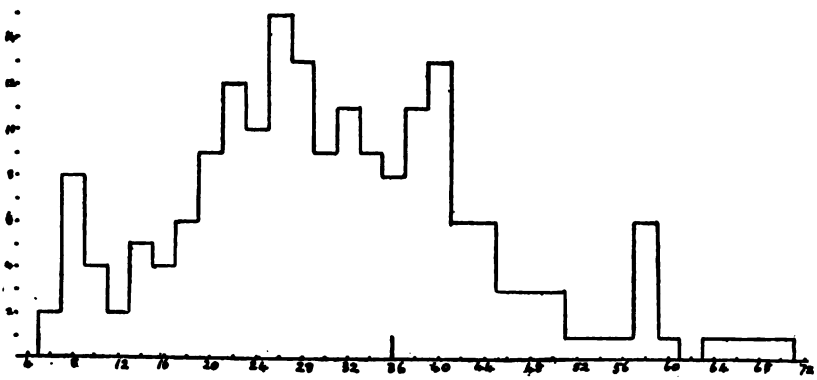

FIGURE 17.—A graphic representation of the data contained in Table 34. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 35.—*Frequency of the different percentages of boys who have reached their present grade one or more years earlier than the normal age of boys for that grade in certain cities of 25,000 population and over.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
Less than 1	9	11	2	22	1
1	19	12	2	25	1
2	21	13	1	28	1
3	13	14	1	29	1
4	8	15	2	30	1
5	10	16	2	31	1
6	5	17	2	35	1
7	10	18	2	36	1
8	6	19	3		
9	3	20	1		133
10	1	21	2		

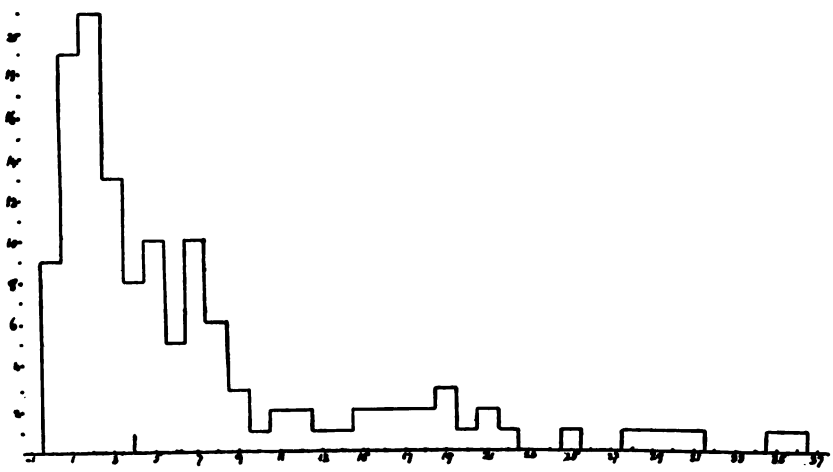

FIGURE 18.—A graphic representation of the data contained in Table 35. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 36.—*Frequency of the different percentages of girls who have reached their present grade one or more years earlier than the normal age of girls for that grade in certain cities of 25,000 population and over.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
Less than 1	4	12	2	27	1
1	22	13	1	28	1
2	15	14	1	29	1
3	14	15	1	33	1
4	11	18	3	35	1
5	12	19	2	36	1
6	4	20	2	37	1
7	4	21	2	39	2
8	7	22	2		
9	4	23	1		133
10	1	24	1		
11	5	25	3		

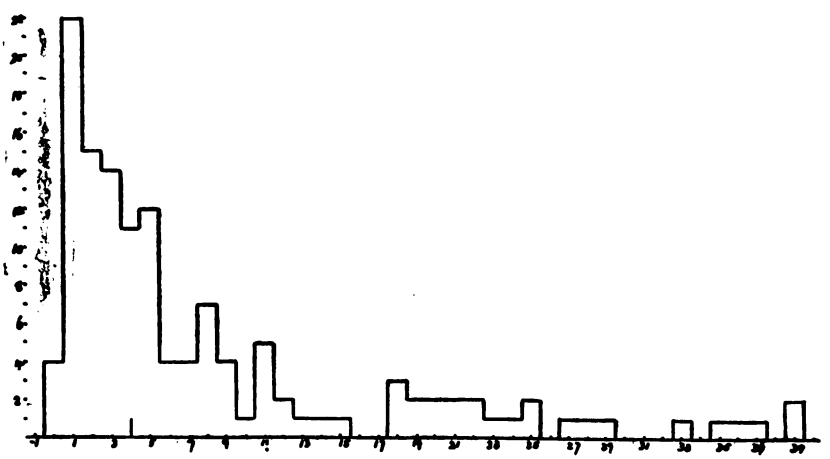

FIGURE 19.—A graphic representation of the data contained in Table 36. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 37.—*Frequency of the different percentages of boys who have reached their present grade one or more years earlier than the normal age of boys for that grade in certain cities of less than 25,000 population.*

Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.	Per cent of total number of boys.	Number of cities.
Less than 1	21	14	2	36	3
1	24	17	3	37	1
2	26	18	3	38	2
3	15	20	1	39	1
4	13	21	3	41	1
5	4	24	3	42	1
6	9	25	1	43	1
7	4	26	3	44	1
8	5	28	2	47	1
9	4	30	2	48	1
10	6	31	1		
11	2	32	4		174
12	2	33	4		
13	5	34	1		

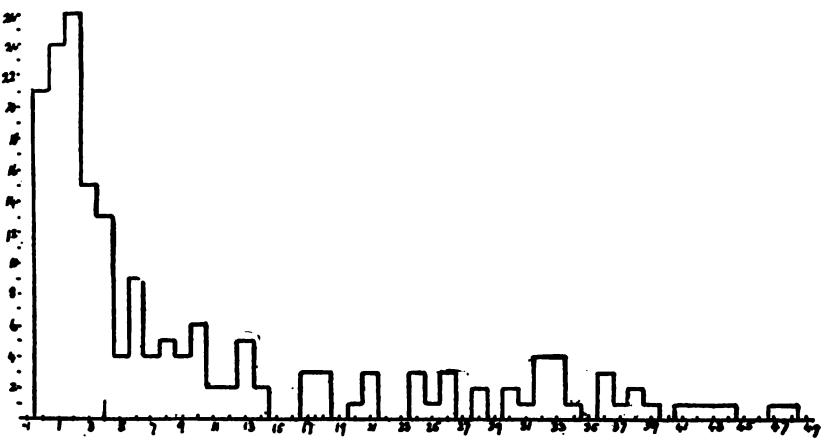

FIGURE 20.—A graphic representation of the data contained in Table 37. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 38.—*Frequency of the different percentages of girls who have reached their present grade one or more years earlier than the normal age of girls for that grade in certain cities of less than 25,000 population.*

Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.	Per cent of total number of girls.	Number of cities.
Less than 1	7	14	3	33	2
1	28	15	1	34	1
2	28	16	1	35	3
3	15	18	1	36	1
4	15	20	3	37	1
5	10	21	2	38	1
6	3	22	2	39	1
7	8	23	1	43	2
8	3	24	2	44	2
9	5	25	2	45	2
10	6	26	2	46	1
11	5	29	2	54	1
12	2	30	1		
13	4	32	1		186

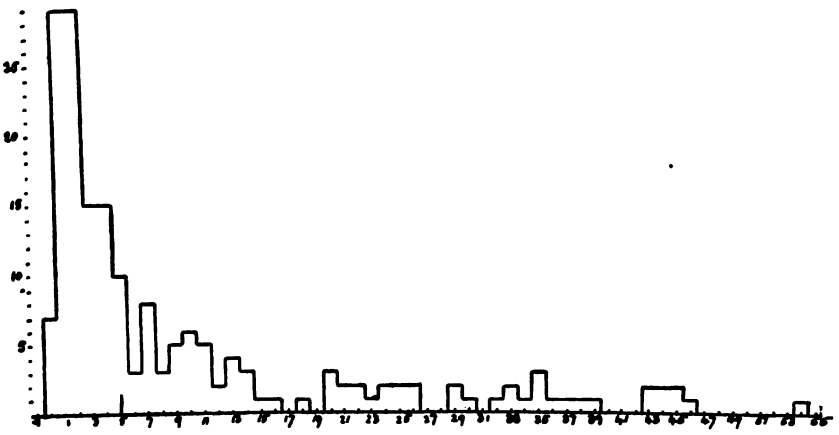

FIGURE 21.—A graphic representation of the data contained in Table 38. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

The tables given above can be summarized best by calling attention to the median per cent for each of the groups indicated. In cities having 25,000 population and more the median per cent of boys of normal age is 56. For girls the median per cent is 60. In the cities of less than 25,000 population the median per cent of boys of normal age is 54, and of girls the median per cent is 58. This means that in half of the cities having more than 25,000 population 56 per cent or more of the boys are of normal age, and that in half of the cities 56 per cent or less of the boys are of normal age. The median in each of the cases falls within a group and is given as the per cent for the whole group. Hence the statement that half the cities have 56 per cent or more normal and half the cities have 56 per cent or less normal. If the calculation were made more exactly the table might read half of the cities have less than 56.6 per cent of boys of normal age.

The medians for all the tables are given in the following table:

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Medians for per cent of whole number of boys or girls who are of normal age, over age or under age.

	Cities of over 25,000.		Cities of less than 25,000.	
	Boys.	Girls.	Boys.	Girls.
Normal	56	60	54	58
1 year over age	20	18	20	18
2 years over age	10	9	11	8
3 years over age	5	3	4	3
4 years over age	2	1	2	1
Total over age	38	32	38	36
Total under age	4	4	4	5

The facts presented in the tables given above make apparent one of the most serious problems of our schools. *If the number of children who enter under the age which is defined as normal were subtracted from the total under-age group, it would be evident at once that our schools do very little to encourage by rapid promotion the child of unusual ability.* On the other hand, the grades are full of children who are two, three, or four years over age. Some of our larger cities have segregated the more extreme cases of retardation in special classes or special schools. We have as yet, however, done comparatively little toward giving these children for whom the ordinary curriculum is not suitable the type of education which will best fit them for future efficiency. When we are willing to differentiate our curriculum to such a degree that each child will have an equal opportunity, because he is doing the thing which will best fit him for later usefulness, the problem of the over-age child will in a considerable measure disappear.

The difficulty which the over-age children present is well illustrated by indicating the number of children of each age that are to be found in a single grade in one city. Take Los Angeles for example. In the first grade there are 2 boys five years of age, 1,237 six years of age, 835 seven years of age, 328 eight years of age, 95 nine years of age, 49 ten years of age, 19 eleven years of age, 8 twelve years of age, 4 thirteen years of age, 2 fourteen years of age, and 1 fifteen years of age. In the fourth grade there are 2 boys seven years of age, 50 eight years of age, 306 nine years of age, 569 ten years of age, 486 eleven years of age, 287 twelve years of age, 130 thirteen years of age, 54 fourteen years of age, 14 fifteen years of age, 8 sixteen years of age, 4 seventeen years of age, and 1 eighteen years of age. A condition similar to that found in Los Angeles is characteristic of our larger cities. Even in the smaller cities, which present a somewhat more favorable environment with respect to stability of population and absence of the foreign element, the conditions are not greatly different. In New Haven, for example, in the first grade there are 483 boys five years old, 605 six years old, 259 seven years old, 89 eight years old, 25 nine years old, 21 ten

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years old, 12 eleven years old, 3 twelve years old, 8 thirteen years old, and 2 fourteen years old. In the fourth grade there are 6 seven years of age, 115 eight years of age, 334 nine years of age, 336 ten years of age, 213 eleven years of age, 134 twelve years of age, 92 thirteen years of age, 14 fourteen years of age, 3 fifteen years of age, and 2 sixteen years of age. In Newton, Mass., a small suburban city, the distribution of boys in the fourth grade is as follows: Three seven years of age, 54 eight, 121 nine, 66 ten, 30 eleven, 17 twelve, 10 thirteen, and 6 fourteen years of age. Of course, no one would claim that the chronological age is an absolute measure of maturity, but the problem remains, nevertheless. When you may find in one grade children from 8 to 15 years of age, or from 6 to 12, the work of the teacher can not, under such conditions, be as effective as it should be. The situation demands grouping on the basis of maturity and educability rather than on the basis of ability to solve arithmetical problems or to spell words not commonly used in the written expression of children.

In the tables which follow are given the results (in per cents) derived by comparing the largest age groups with the number in each grade. Boys and girls are given separately.

TABLE 39.—*Frequency of the different percentages of the largest age group of boys found in the first grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
90	1	160	8	230	3
100	2	170	15	250	2
110	7	180	14	280	1
120	9	190	5		
130	20	200	6		133
140	13	210	2		
150	22	220	3		

Median percentage, 150.

TABLE 40.—*Frequency of the different percentages of the largest age group of girls found in the first grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
70	1	150	18	230	1
90	3	160	12	240	2
100	3	170	9	250	2
110	7	180	5	270	1
120	18	190	7		
130	16	200	3		133
140	24	210	1		

Median percentage, 140.

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TABLE 41.—*Frequency of the different percentages of the largest age group of boys found in the first grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
70	1	150	22	230	1
80	1	160	18	240	2
90	3	170	11	260	1
100	7	180	10	270	1
110	12	190	6	310	1
120	17	200	4		
130	25	210	10		186
140	28	220	5		

Median percentage, 140.

TABLE 42.—*Frequency of the different percentages of the largest age group of girls found in the first grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
60	1	140	17	220	1
70	1	150	23	230	2
80	4	160	12	240	1
90	5	170	6	260	2
100	20	180	5	270	2
110	26	190	6		
120	17	200	4		186
130	27	210	4		

Median percentage, 130.

TABLE 43.—*Frequency of the different percentages of the largest age group of boys found in the second grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
80	1	120	21	150	4
95	5	125	20	170	1
100	3	130	15		
105	12	135	9		133
110	12	140	7		
115	20	145	3		

Median percentage, 120.

TABLE 44.—*Frequency of the different percentages of the largest age group of girls found in the second grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
80	1	110	20	140	2
85	2	115	23	145	3
90	6	120	16	165	2
95	5	125	10	200	1
100	15	130	9		
105	15	135	3		133

Median percentage, 115.

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TABLE 45.—*Frequency of the different percentages of the largest age group of boys found in the second grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
75	1	115	25	155	1
80	4	120	17	160	1
85	3	125	16	165	2
90	7	130	9	185	1
95	12	135	10		
100	13	140	10		186
105	23	145	3		
110	24	150	4		

Median percentage, 115.

TABLE 46.—*Frequency of the different percentages of the largest age group of girls found in the second grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
70	3	110	18	150	3
75	5	115	18	155	1
80	6	120	14	160	1
85	9	125	6	165	3
90	7	130	11	180	1
95	23	135	4		
100	25	140	2		186
105	25	145	1		

Median percentage, 105.

TABLE 47.—*Frequency of the different percentages of the largest age group of boys found in the third grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
75	1	110	18	145	2
80	1	115	19	150	2
85	1	120	28	205	1
90	2	125	14		
95	5	130	5		133
100	13	135	8		
105	11	140	2		

Median percentage, 115.

TABLE 48.—*Frequency of the different percentages of the largest age group of girls found in the third grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
80	3	110	25	140	3
85	3	115	23	150	1
90	3	120	16	170	1
95	6	125	8		
100	13	130	10		133
105	16	135	2		

Median percentage, 110.

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TABLE 49.—*Frequency of the different percentages of the largest age group of boys found in the third grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
60	2	100	17	140	5
65	1	105	23	145	2
70	3	110	22	150	2
75	1	115	22	160	2
80	10	120	20	170	2
85	4	125	11		
90	8	130	10		186
95	14	135	5		

Median percentage, 110.

TABLE 50.—*Frequency of the different percentages of the largest age group of girls found in the third grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
55	2	100	28	140	3
65	1	105	14	150	1
70	2	110	21	155	1
75	7	115	16	160	1
80	6	120	18	165	1
85	10	125	14		
90	15	130	7		186
95	15	135	3		

Median percentage, 105.

TABLE 51.—*Frequency of the different percentages of the largest age group of boys found in the fourth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
65	1	100	15	130	4
75	1	105	19	135	2
80	1	110	17	140	2
85	8	115	23	155	1
90	3	120	15		
95	7	125	14		133

Median percentage, 110.

TABLE 52.—*Frequency of the different percentages of the largest age group of girls found in the fourth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
60	1	100	17	125	7
65	1	105	26	130	5
85	2	110	24	140	2
90	2	115	24		
95	7	120	15		133

Median percentage, 110.

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TABLE 53.—*Frequency of the different percentages of the largest age group of boys found in the fourth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
55	1	95	16	130	5
65	1	100	31	135	2
70	2	105	22	140	2
75	5	110	14	145	1
80	8	115	20	150	1
85	8	120	22		
90	15	125	10		186

Median percentage, 105.

TABLE 54.—*Frequency of the different percentages of the largest age group of girls found in the fourth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
50	4	90	16	130	2
55	1	95	29	135	1
60	1	100	22	145	1
65	4	105	23	160	1
70	3	110	19		
75	6	115	17		186
80	8	120	13		
85	11	125	4		

Median percentage, 100.

TABLE 55.—*Frequency of the different percentages of the largest age group of boys found in the fifth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
65	3	90	9	115	8
70	3	95	10	120	9
75	5	100	30	125	1
80	10	105	23		
85	6	110	16		133

Median percentage, 100.

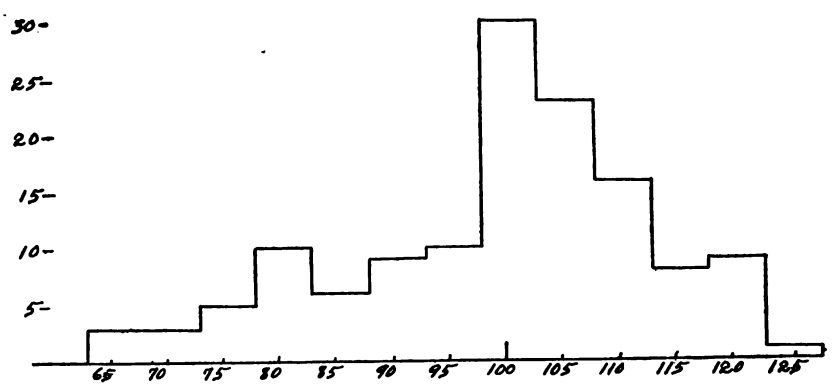

FIGURE 22.—A graphic representation of the data contained in Table 55. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 56.—*Frequency of the different percentages of the largest age group of girls found in the fifth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
55	1	85	13	110	17
65	1	90	14	115	6
70	1	95	24	120	2
75	2	100	20		
80	9	105	23		123

Median percentage, 95.

FIGURE 23.—A graphic representation of the data contained in Table 56. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 57.—*Frequency of the different percentages of the largest age group of boys found in the fifth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
45	2	85	11	125	4
50	1	90	13	130	1
55	1	95	23	135	3
60	5	100	16	145	1
65	2	105	14		
70	6	110	24		186
75	16	115	9		
80	19	120	15		

Median percentage, 95.

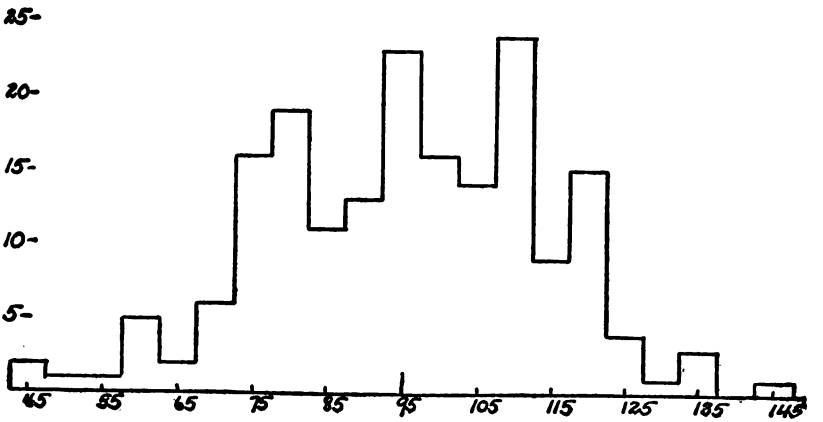

FIGURE 24.—A graphic representation o the data contained in Table 57. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 58.—*Frequency of the different percentages of the largest age group of girls found in the fifth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
45	1	80	1	115	5
50	5	85	20	120	5
55	3	90	19	125	2
60	6	95	23	130	2
65	9	100	26	140	1
70	6	105	25		
75	18	110	9		186

Median percentage, 95.

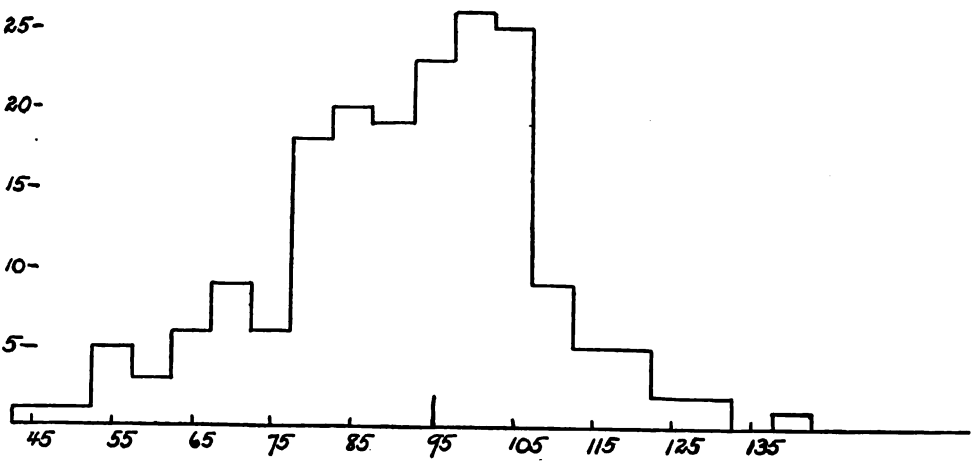

FIGURE 25.—A graphic representation of the data contained in Table 58. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 59.—*Frequency of the different percentages of the largest age group of boys found in the sixth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
40	5	70	9	100	9
45	1	75	7	105	8
50	2	80	21	110	1
55	1	85	23	115	1
60	7	90	18		
65	8	95	12		133

Median percentage, 85.

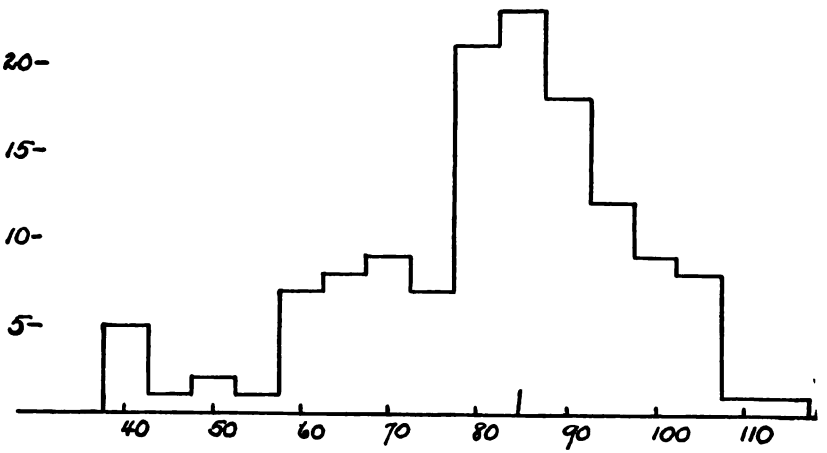

FIGURE 26.—A graphic representation of the data contained in Table 59. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 60.—*Frequency of the different percentages of the largest age group of girls found in the sixth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
45	2	75	15	105	8
50	2	80	9	110	3
55	3	85	22	120	1
60	3	90	21		
65	8	95	23		133
70	4	100	9		

Median percentage, 85.

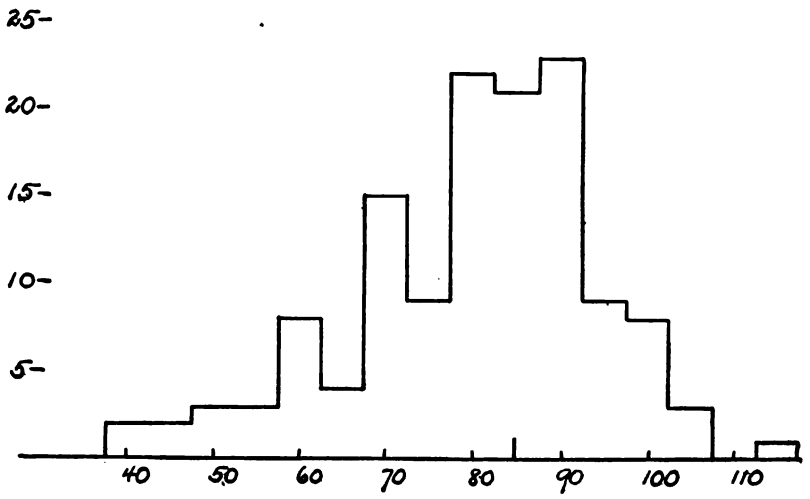

FIGURE 27.—A graphic representation of the data contained in Table 60. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 61.—*Frequency of the different percentages of the largest age group of boys found in the sixth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
25	2	70	18	110	5
30	1	75	18	115	3
40	3	80	18	120	2
45	6	85	24	130	1
50	2	90	20		
55	7	95	14		186
60	8	100	11		
65	10	105	13		

Median percentage, 80.

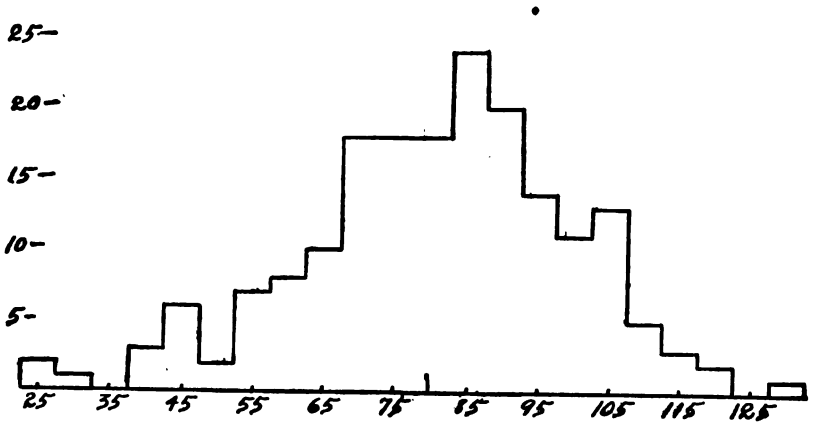

FIGURE 28.—A graphic representation of the data contained in Table 61. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 62.—*Frequency of the different percentages of the largest age group of girls found in the sixth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
35	1	70	11	105	16
40	1	75	20	110	7
45	2	80	19	115	3
50	7	85	15	120	2
55	3	90	23		
60	10	95	14		186
65	11	100	20		

Median percentage, 85.

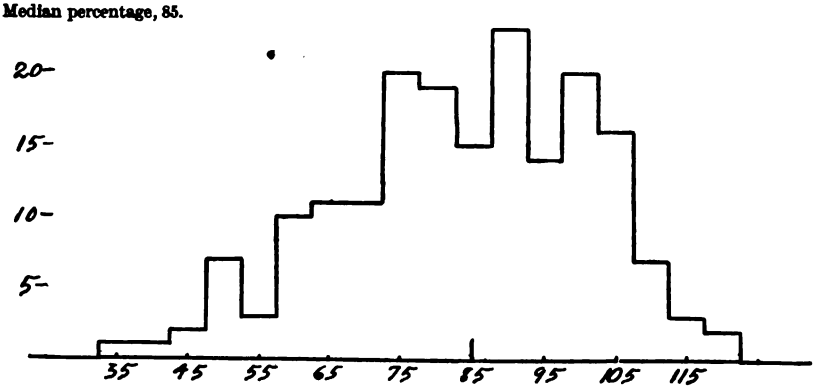

FIGURE 29.—A graphic representation of the data contained in Table 62. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 63.—*Frequency of the different percentages of the largest age group of boys found in the seventh grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
20	1	60	14	95	2
30	2	65	16	100	1
35	3	70	14	105	5
40	4	75	14		
45	14	80	13		133
50	7	85	8		
55	11	90	4		

Median percentage, 65.

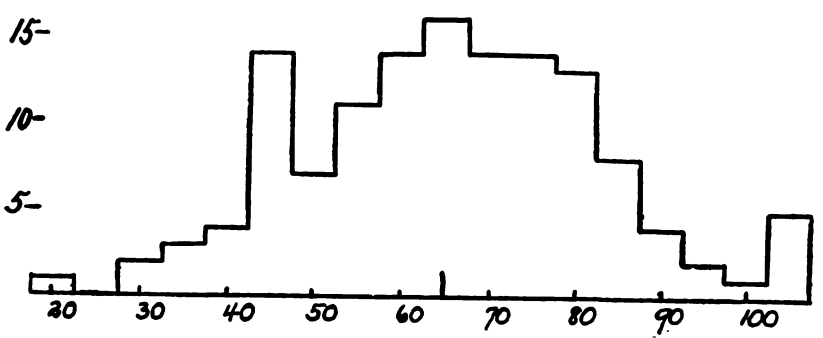

FIGURE 30.—A graphic representation of the data contained in Table 63. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 64.—*Frequency of the different percentages of the largest age group of girls found in the seventh grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
30	2	65	12	95	5
40	4	70	21	100	6
45	4	75	18	110	1
50	10	80	16		
55	5	85	10		133
60	10	90	9		

Median percentage, 75.

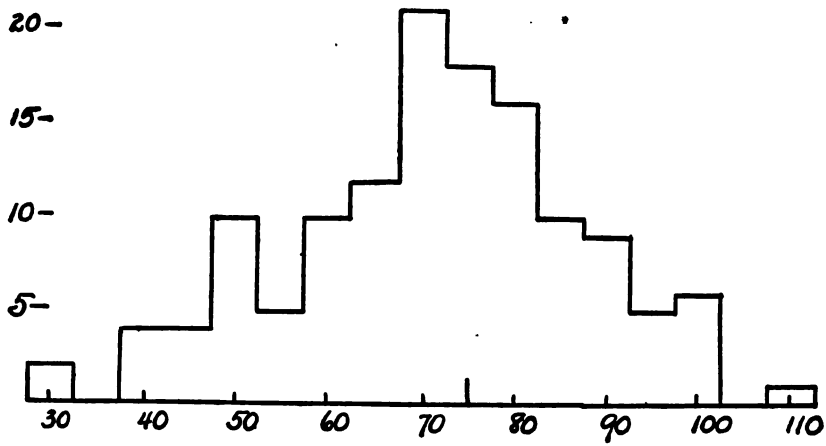

FIGURE 31.—A graphic representation of the data contained in Table 64. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 65.—*Frequency of the different percentages of the largest age group of boys found in the seventh grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
20	3	55	10	90	15
25	3	60	22	95	6
30	3	65	19	100	2
35	7	70	29	105	1
40	9	75	17		
45	6	80	19		186
50	11	85	5		

Median percentage, 70.

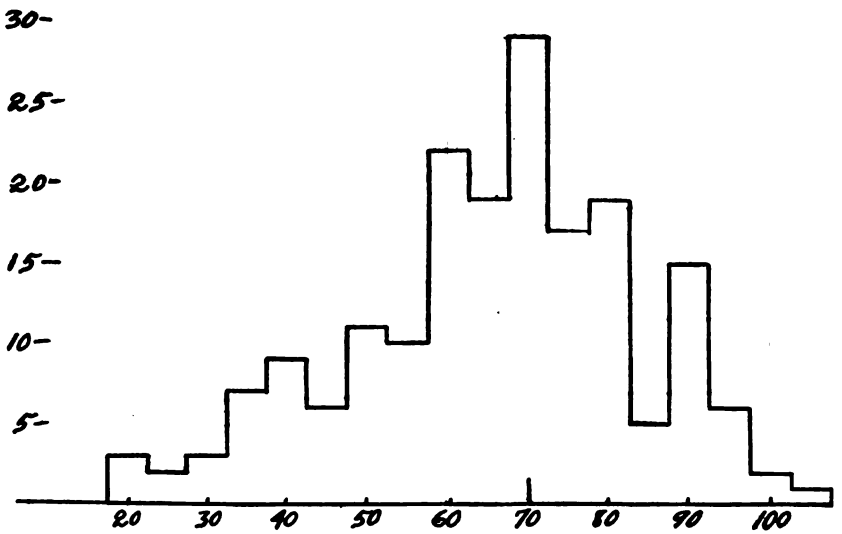

FIGURE 32.—A graphic representation of the data contained in Table 65. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 66.—*Frequency of the different percentages of the largest age group of girls found in the seventh grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
10	1	60	21	100	8
25	1	65	15	105	5
30	3	70	28	110	1
35	3	75	17	115	1
40	5	80	21	130	1
45	8	85	12		
50	8	90	16		186
55	7	95	4		

Median percentage, 70.

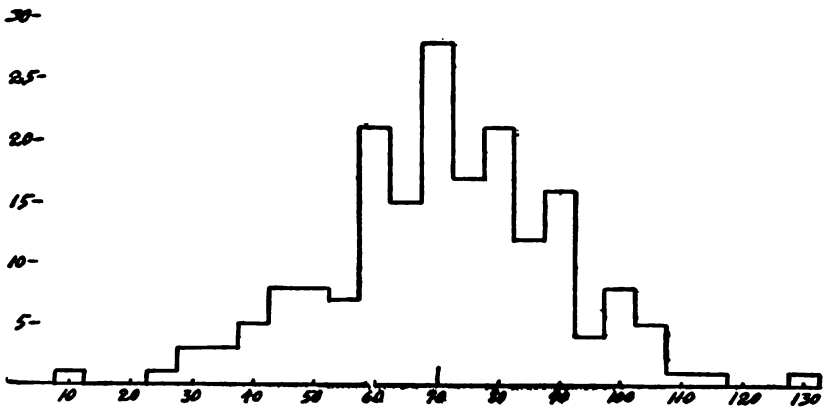

FIGURE 23.—A graphic representation of the data contained in Table 66. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 67.—*Frequency of the different percentages of the largest age group of boys found in the eighth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
15	1	45	10	75	6
20	1	50	21	80	3
25	4	55	16	85	1
30	9	60	13	90	1
35	9	65	7		
40	14	70	8		124

Median percentage, 50.

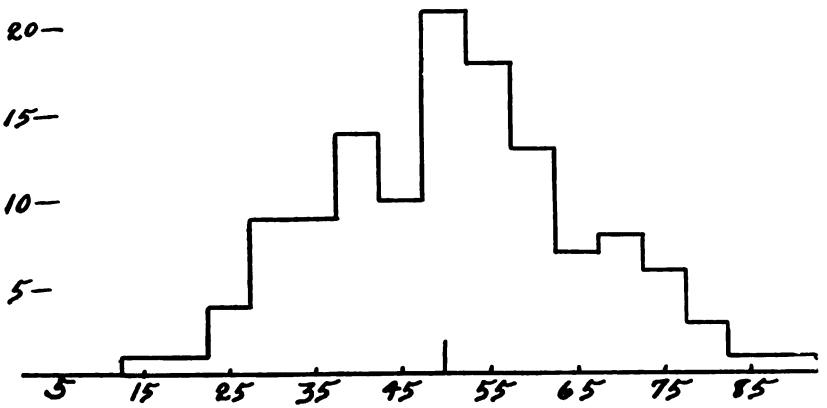

FIGURE 34.—A graphic representation of the data contained in Table 67. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 68.—*Frequency of the different percentages of the largest age group of girls found in the eighth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
25	3	55	11	85	3
30	2	60	22	90	2
35	5	65	15	100	1
40	17	70	12		
45	4	75	9		124
50	17	80	1		

Median percentage, 60.

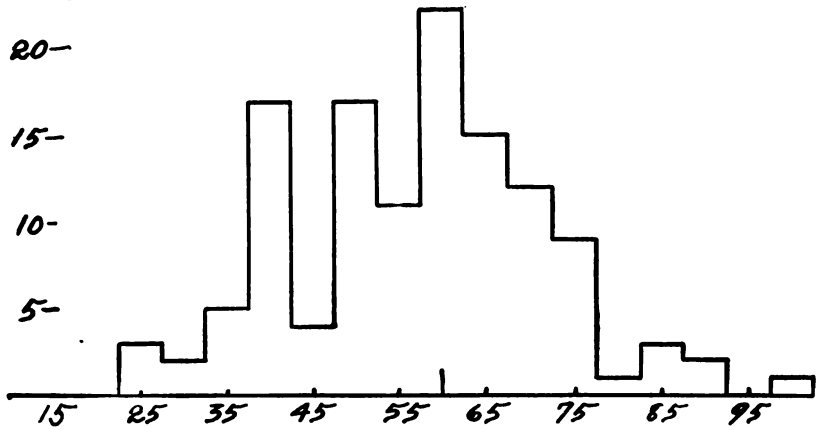

FIGURE 35.—A graphic representation of the data contained in Table 68. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 69.—*Frequency of the different percentages of the largest age group of boys found in the eighth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
5	1	40	16	75	7
10	1	45	20	80	5
15	5	50	26	85	2
20	4	55	16	90	3
25	4	60	11		
30	8	65	18		174
35	10	70	17		

Median percentage, 50.

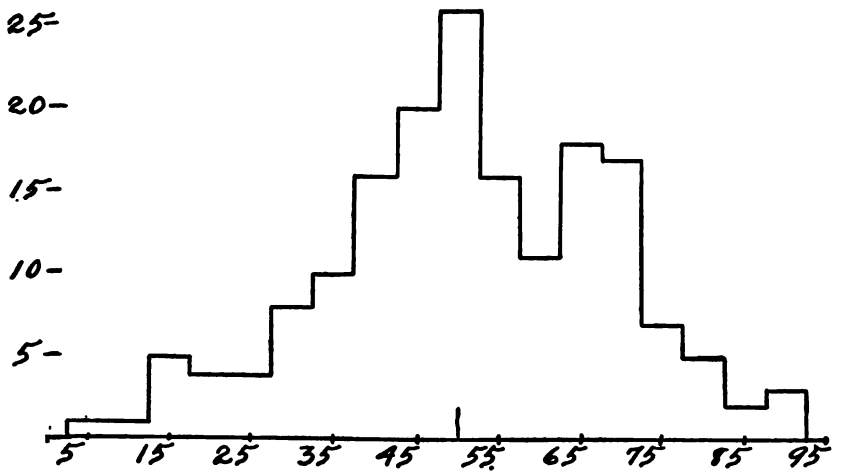

FIGURE 36.—A graphic representation of the data contained in Table 69. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 70.—*Frequency of the different percentages of the largest age group of girls found in the eighth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
10	3	45	12	80	11
15	1	50	19	85	5
20	2	55	18	90	7
25	4	60	24	100	2
30	8	65	19	115	1
35	2	70	14		
40	14	75	8		174

Median percentage, 60.

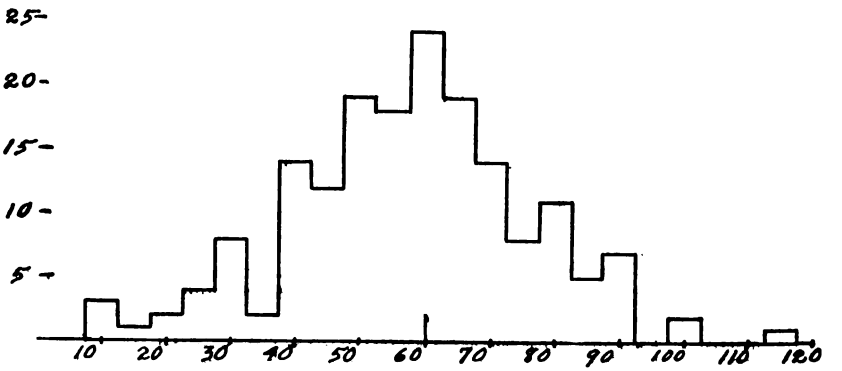

FIGURE 37.—A graphic representation of the data contained in Table 70. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 71.—*Frequency of the different percentages of the largest age group of boys found in the ninth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
20	3	45	2	65	2
30	1	50	3	70	1
35	4	55	1		
40	2	60	5		24

Median percentage, 47.

TABLE 72.—*Frequency of the different percentages of the largest age group of girls found in the ninth grade in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
20	1	50	7	70	4
25	1	55	2	75	1
30	1	60	1		
35	1	65	3		24
40	2				

Median percentage, 50.

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TABLE 73.—*Frequency of the different percentages of the largest age group of boys found in the ninth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
10	1	45	2	70	3
25	3	50	1	75	1
30	3	55	6		
35	3	60	2		30
40	3	65	2		

Median percentage, 47.

TABLE 74.—*Frequency of the different percentages of the largest age group of girls found in the ninth grade in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
20	1	45	3	75	1
25	1	50	5	85	1
30	5	60	1		
35	1	65	2		30
40	6	70	3		

Median percentage, 45.

TABLE 75.—*Frequency of the different percentages of the largest age group of boys found in the first year of high school in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
15	5	40	19	70	2
20	15	45	12	75	2
25	11	50	13	80	1
30	24	55	4		
35	11	60	8		127

Median percentage, 35.

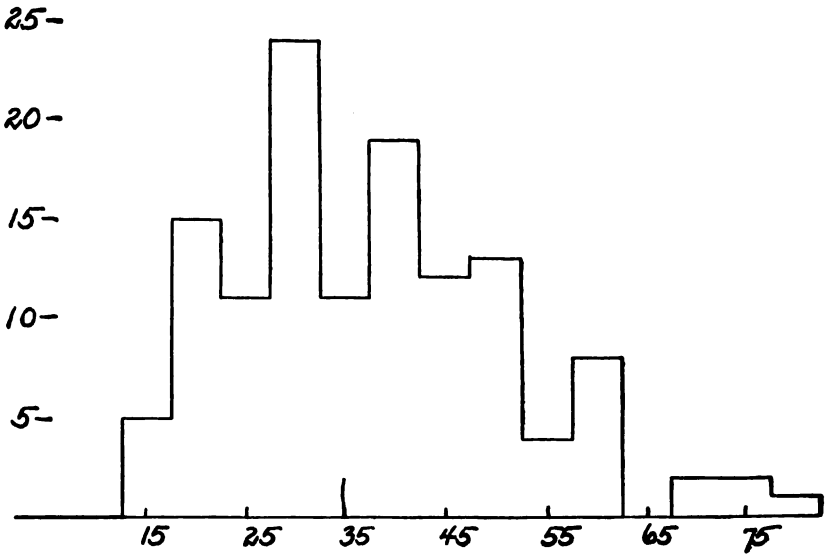

FIGURE 38.—A graphic representation of the data contained in Table 75. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 76.—*Frequency of the different percentages of the largest age group of girls found in the first year of high school in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
15	3	45	26	75	2
20	7	50	10	90	1
25	5	55	13		
30	12	60	8		127
35	12	65	7		
40	17	70	4		

Median percentage, 45.

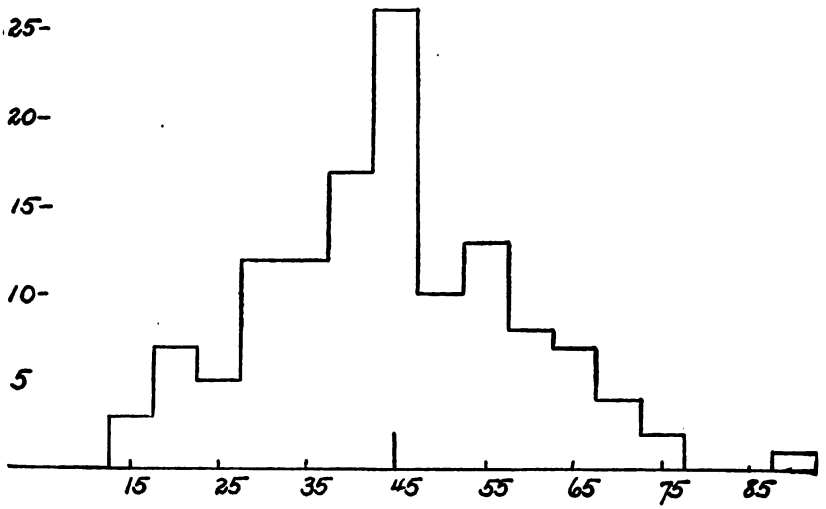

FIGURE 39.—A graphic representation of the data contained in Table 76. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 77.—*Frequency of the different percentages of the largest age group of boys found in the first year of high school in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
5	1	45	12	85	2
10	4	50	26	95	1
15	4	55	7	105	1
20	8	60	6	115	1
25	11	65	5	125	1
30	23	70	3		
35	13	75	1		164
40	31	80	3		

Median percentage, 40.

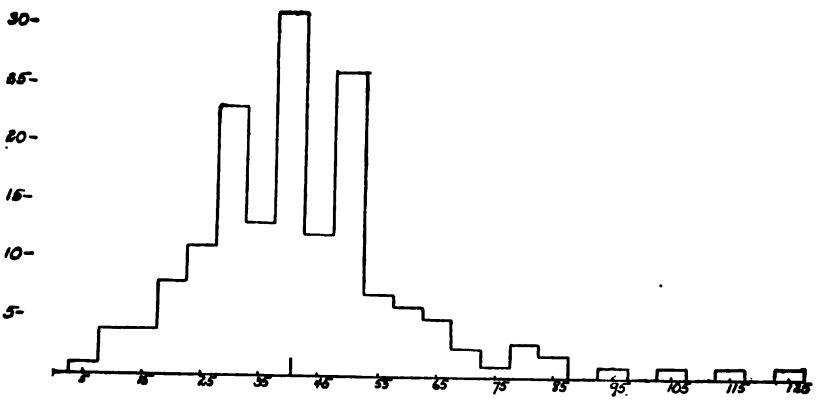

FIGURE 40.—A graphic representation of the data contained in Table 77. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 78.—*Frequency of the different percentages of the largest age group of girls found in the first year of high school in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
10	1	50	27	90	4
15	2	55	10	105	1
20	8	60	14	110	1
25	6	65	11	120	1
30	16	70	3		
35	9	75	9		164
40	22	80	2		
45	15	85	2		

Median percentage, 50.

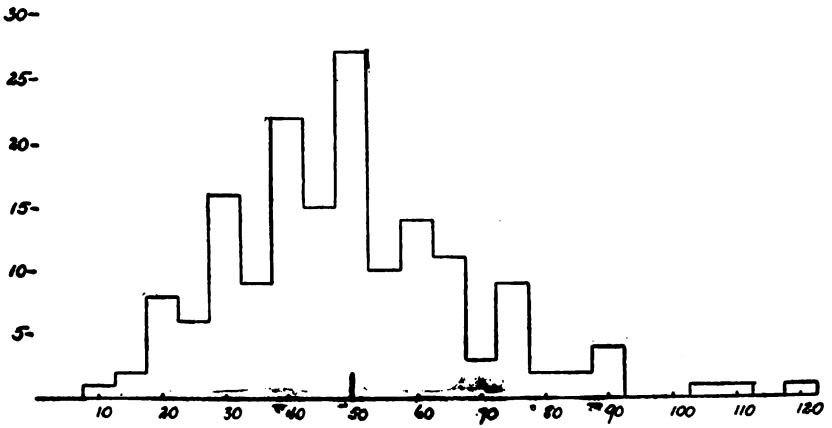

FIGURE 41.—A graphic representation of the data contained in Table 78. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 79.—*Frequency of the different percentages of the largest age group of boys found in the second year of high school in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
5	1	25	19	45	2
10	10	30	18	50	2
15	20	35	5		
20	46	40	4		127

Median percentage, 20.

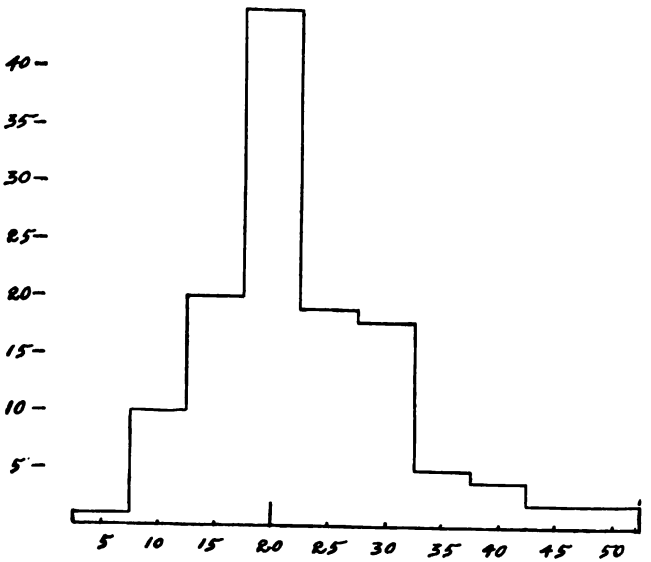

FIGURE 42.—A graphic representation of the data contained in Table 79. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 80.—*Frequency of the different percentages of the largest age group of girls found in the second year of high school in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
10	4	30	34	50	2
15	13	35	14	55	1
20	23	40	14		
25	16	45	6		127

Median percentage, 30.

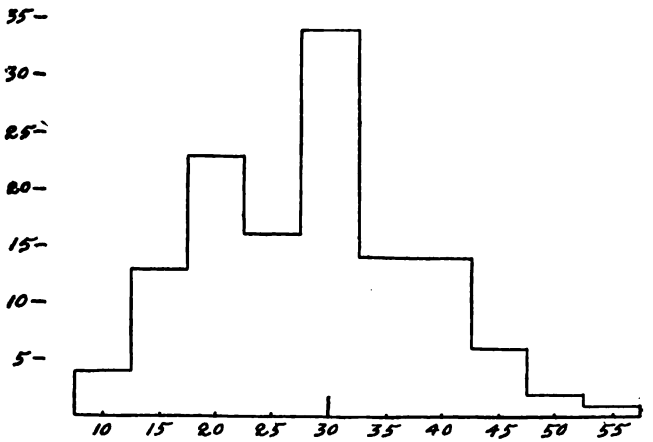

FIGURE 43.—A graphic representation of the data contained in Table 80. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 81.—*Frequency of the different percentages of the largest age group of boys found in the second year of high school in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
5	4	30	20	55	3
10	11	35	15	60	2
15	23	40	12	70	1
20	37	45	2		
25	29	50	5		164

Median percentage, 25.

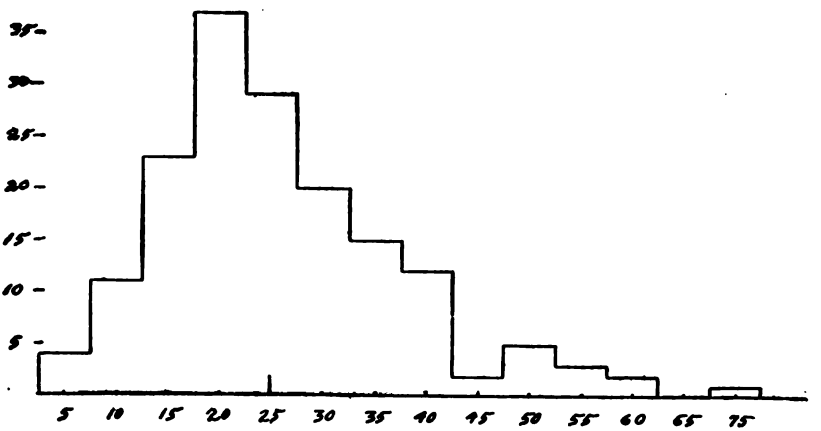

FIGURE 44.—A graphic representation of the data contained in Table 81. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 82.—*Frequency of the different percentages of the largest age group of girls found in the second year of high school in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
5	2	35	23	65	2
10	7	40	22	70	2
15	6	45	13	80	1
20	22	50	11		
25	15	55	5		164
30	28	60	5		

Median percentage, 35.

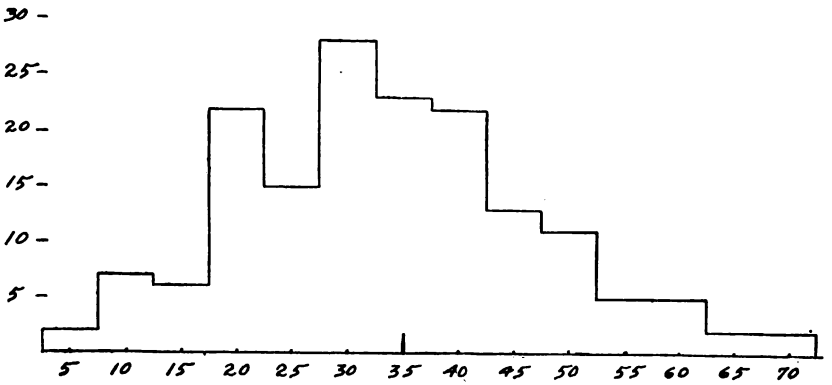

FIGURE 45.—A graphic representation of the data contained in Table 82. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 83.—*Frequency of different percentages of the largest age group of boys found in the third year of high school in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
4	3	18	12	32	1
6	4	20	9	34	2
8	12	22	6	40	1
10	9	24	4	48	1
12	19	26	4		
14	17	28	1		127
16	20	30	2		

Median percentage, 14.

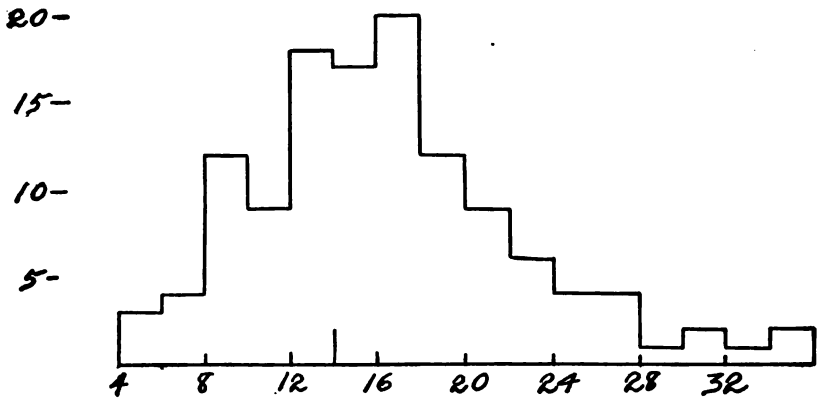

FIGURE 46.—A graphic representation of the data contained in Table 83. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 84.—*Frequency of the different percentages of the largest age group of girls found in the third year of high school in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
2	1	20	11	34	2
8	3	22	13	36	3
10	7	24	12	38	4
12	10	26	10	42	2
14	8	28	8	54	1
16	9	30	6		
18	15	32	1		127

Median percentage, 20.

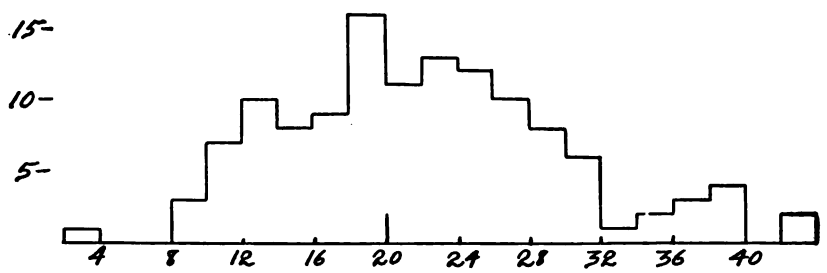

FIGURE 47.—A graphic representation of the data contained in Table 84. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 85.—*Frequency of the different percentages of the largest age group of boys found in the third year of high school in certain cities of less than 25.000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
4	5	22	14	40	1
6	4	24	11	42	1
8	14	26	9	50	1
10	6	28	3	52	1
12	10	30	4	54	1
14	14	32	6		
16	24	34	1		163
18	17	36	5		
20	10	38	1		

Median percentage, 18.

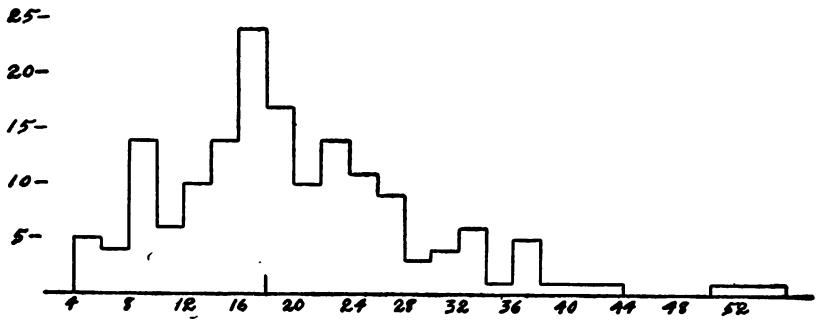

FIGURE 48.—A graphic representation of the data contained in Table 85. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 86.—*Frequency of the different percentages of the largest age group of girls found in the third year of high school in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
4	4	24	12	44	3
6	2	26	6	46	1
8	1	28	10	48	2
10	7	30	16	52	1
12	7	32	8	54	1
14	11	34	6	58	1
16	12	36	2	62	2
18	11	38	3	78	1
20	11	40	5		
22	14	42	3		163

Median percentage, 24.

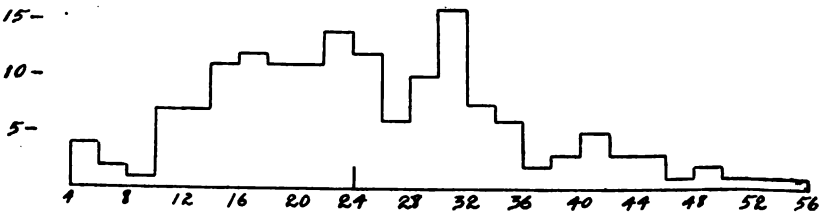

FIGURE 49.—A graphic representation of the data contained in Table 86. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 87.—*Frequency of the different percentages of the largest group of boys found in the fourth year of high school in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
4	14	14	15	24	2
6	14	16	5	26	2
8	25	18	5		
10	18	20	5		123
12	15	22	3		

Median percentage, 10.

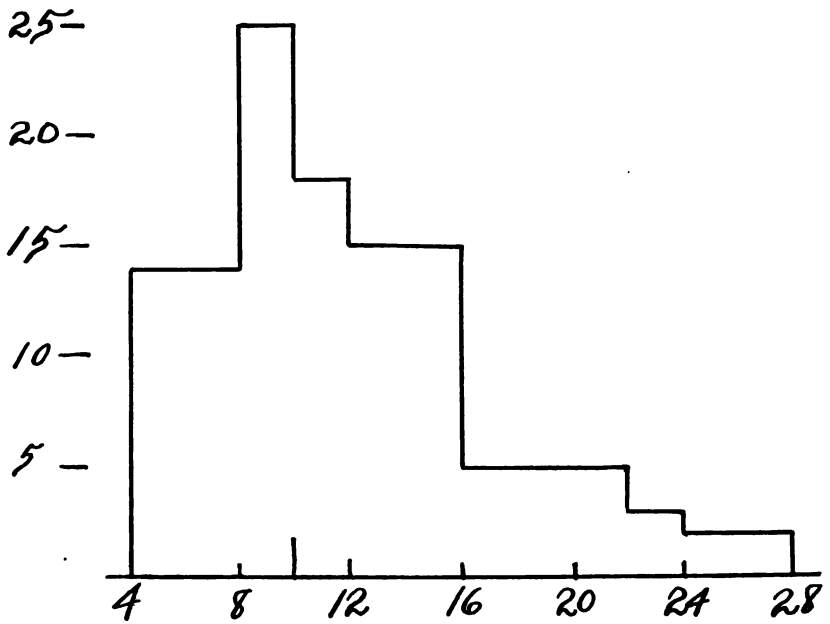

FIGURE 50.—A graphic representation of the data contained in Table 87. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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Table 88.—*Frequency of the different percentages of the largest age group of girls found in the fourth year of high school in certain cities of 25,000 population and over.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
2	1	16	17	32	4
4	2	18	16	34	1
6	4	20	8	36	2
8	7	22	9		
10	9	24	7		123
12	10	26	3		
14	20	30	3		

Median percentage, 16.

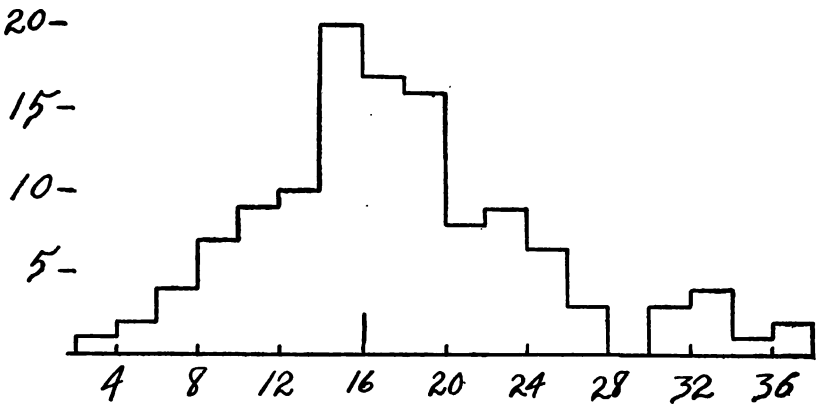

Figure 51.—A graphic representation of the data contained in Table 88. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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TABLE 89.—*Frequency of the different percentages of the largest age group of boys found in the fourth year of high school in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
2	5	16	13	30	2
4	9	18	11	32	3
6	14	20	9	36	1
8	17	22	2	38	1
10	18	24	5		
12	19	26	6		153
14	14	28	4		

Median percentage, 12.

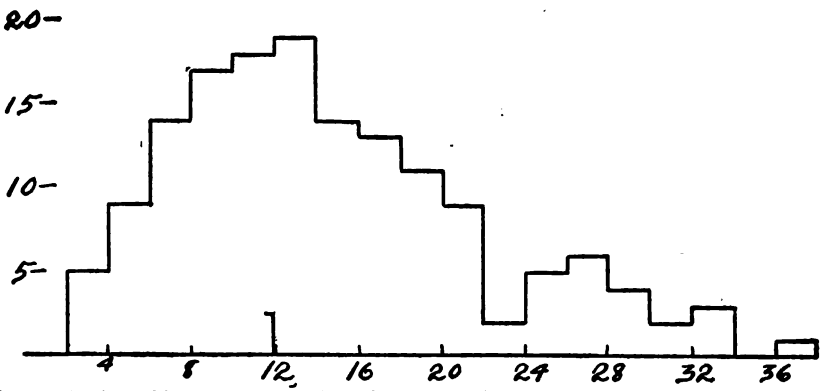

FIGURE 52.—A graphic representation of the data contained in Table 89. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

TABLE 90.—*Frequency of the different percentages of the largest age group of girls found in the fourth year of high school in certain cities of less than 25,000 population.*

Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.	Per cent of the largest age group.	Number of cities.
2	2	20	18	38	4
4	2	22	8	40	1
6	4	24	12	42	3
8	4	26	9	48	2
10	13	28	8	50	1
12	16	30	3	52	1
14	6	32	7	66	1
16	10	34	5		
18	10	36	2		153

Median percentage, 20.

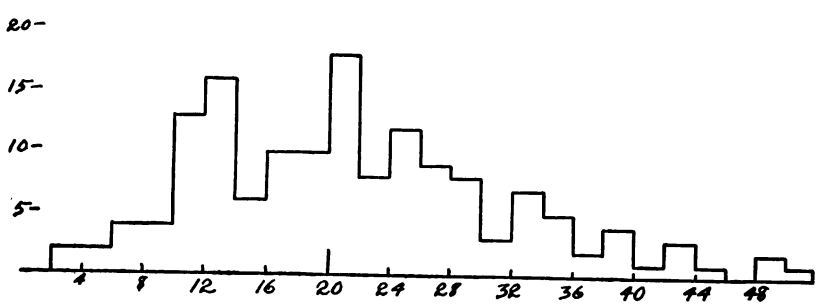

FIGURE 53.—A graphic representation of the data contained in Table 90. The percentages are represented on the horizontal scale and the number of cities on the vertical scale.

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The significance of the tables and diagrams given above can be seen at a glance by taking the median per cent for each group of cities for each grade of the school. These medians are given in the table which follows. It must be remembered that half of the cities show a condition which is better than that indicated by this single figure and that half show a poorer condition. For the student who wishes to study the tables more carefully the extreme cases would be interesting, and the middle 50 per cent of the cases might be taken as indicating the normal condition of affairs.

Medians for per cent of the largest age group found in each grade.

Grade of pupil.	Cities of over 25,000.		Cities of less than 25,000.	
	Boys.	Girls.	Boys.	Girls.
1-year	150	140	140	130
2-year	120	115	115	105
3-year	115	110	110	105
4-year	110	110	105	100
5-year	100	95	95	95
6-year	85	85	80	85
7-year	65	75	70	70
8-year	50	60	50	60
9-year	47	50	47	45
1 high school	35	45	40	50
2 high school	20	30	25	35
3 high school	14	20	18	24
4 high school	10	16	12	20

It will be apparent by glancing at the medians given above that in the early grades of the elementary school very many children are retarded, since the percentage of the largest age group which is found in any one grade is essentially the percentage of the number entering school who are to be found in that grade. If there are more than 100 per cent of the entering group in a single grade, manifestly some of them have failed to pass out of that grade at the end of the year or have been demoted to it. It will be noticed by examining carefully the tables from which these medians are derived that the particular grade in which the largest number of children is found varies somewhat. That is, cities differ somewhat in the fixing of the point where children are carefully classified. Quite commonly the first grade is largest, because it is here that children of very different capacity are received and some are detained for another year or more. This difference in capacity is, however, not overcome by staying in the first grade two years. As children progress through the grades there are still large numbers of them who are detained two or more years in a grade.

In general it may be said that there is relatively little elimination during the first four grades.[1] The amount of elimination for these grades will, however, vary greatly among the several cities.

[1] See The elimination of pupils from school, by Edward L. Thorndike. Washington, Government Printing Office, 1908. 63 p. incl. tables, diagrs. 8° (U. S. Bureau of Education. Bulletin, 1907, no. 4). Also articles by same author on Promotion, retardation, and elimination. Psychological clinic, 3: 232–240, 255–265, Jan. 15, and Feb. 15, 1910.

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From the fifth grade on elimination becomes a prominent factor, reducing the number of children in a grade, especially the number of repeaters. It will be noticed that the median per cent of the largest age group found in the fifth grade varies from 95 to 100. This does not mean that 95 per cent of the total number of children who enter school during the year equals the number of children who enter the fifth grade during this year, but rather that the number of the children entering the grade plus those who are repeating it amount to from 95 per cent to 100 per cent of the number entering school during the current year. These figures indicate the median, and it must be remembered that in half the cities there were less than this per cent in the grade, and that in half the cities more than this per cent were found in the fifth grade. For the sixth, seventh, and eighth grades it would seem, from careful study of a few cities recently made by graduate students in Teachers College, Columbia University, that a fair estimate of the number of repeaters in the sixth, seventh, and eighth grades would be 12 per cent of the total number in the grade for the sixth grade, 10 per cent for the seventh grade, and 8 per cent for the eighth grade. If these corrections are applied to the tables given above, it is possible to estimate fairly accurately the elimination in these grades. For example, omitting repeaters, the percentage of boys in cities of more than 25,000 population in the entering group who actually enter a sixth grade would be represented by a median of 73 per cent; the seventh grade by a median of 55 per cent; while the eighth grade would show a median of approximately 42 per cent. That is, in half of the cities we might expect to find less than 73 per cent of the entering group who have actually entered the sixth grade during the current year, while in half the cities the percentage would be larger. For one-half of the cities 55 per cent or less of the number entering school entered the seventh grade during the current year, and for one-half of the cities 55 per cent or more of the entering group entered the seventh grade during the same year. For the eighth grade the point of division falls at 42.

The figures for the high schools are interesting because of the very rapid elimination indicated during the first three years. The median per cent of the entering group found in the first year of high school varies from 35 to 50. In the second year we find medians varying from 20 to 35, a dropping off of from a half to a third. In the third year the medians ranged from 14 to 24. While in the fourth year we find medians of only 10 to 20 per cent. As was indicated in the discussion concerning the upper grades, these figures, especially for the first three years of high school, need to be corrected for repeaters if we wish to compare the number entering the first year of the elementary school with the number entering any one year of high school.

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In all of the tables thus far considered, it is interesting to note the difference between boys and girls. In general, there are more boys over age and more girls under age. This does not mean that the girls are always superior and that the boys are always inferior. Indeed, a careful analysis of individual cases would show that while the boys undoubtedly show the most extreme cases of retardation, they also furnish the extreme cases of acceleration. On the whole, however, the school as at present constituted makes a stronger appeal to girls than to boys, and especially in our high schools the elimination of boys is much more marked than for girls.

It will also be interesting, to anyone who cares to examine closely the tables or diagrams which have been given, to note the common or modal condition as compared with the extreme conditions of elimination or retardation which are indicated. It might be suggested that that city which shows a greater elimination or retardation than is indicated for that half of the cities which show the least elimination and retardation has need to examine closely the reasons for the conditions which exist.

SOME DATA CONCERNING THE STUDENT BODY IN AMERICAN COLLEGES.

Ninety-three colleges having more than 100 students each responded to the request of the bureau for an age grade census. Of these, 10 were women's colleges, 34 were colleges which receive men only, and 49 were coeducational institutions; 18 State institutions are included. Twenty-seven of the colleges reporting have more than 500 students each, 25 have from 300 to 500, and 41 have from 100 to 300 students. It is safe, I believe, to claim that the conclusions derived from these data would, in the main, be true for this whole group of institutions which are represented by the 93 colleges reporting.

From the data giving age by classes the following facts concerning the persistence in college were found. Using the total number enrolled in the freshman class as the basis of calculations in colleges having over 500 students, the per cent of the number of men found in the freshman class who remain in the sophomore class varies from 40 to 100. The median per cent is 76. Excluding the extremes the middle 50 per cent range from 65 to 92 per cent.

The figures for the junior class are, limits 25 to 100 per cent, median per cent 57. The middle 50 per cent lie between 42 and 71 per cent. For the senior class the limits are 12 to 90 per cent. The median is 46 per cent. The middle 50 per cent lie between 30 and 67 per cent.

For the colleges having from 300 to 500 students the elimination from the freshman and sophomore classes is somewhat greater than that found in the larger institutions, but the per cent of seniors retained is the same in both cases. The median percentage for the sophomore class is 66 as against 76 for the larger colleges; for the

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junior class it is 52 as against 57 for the larger colleges, and for the senior it is 46, which is the figure for the larger institutions.

For the colleges having from 100 to 300 students the same tendency is noticeable—that is, a somewhat larger elimination from the freshman and sophomore classes, which is counteracted by a greater persistence from the junior to the senior class.

For the men in all of the colleges the figures are: For the sophomore class—median 71 per cent, middle 50 per cent within limits 56 and 83 per cent; for the junior class—median 55 per cent, middle 50 per cent within limits 40 to 69 per cent; for the senior class—median 46 per cent, middle 50 per cent within limits 28 to 60 per cent.

For women the elimination is somewhat greater than for men. As in the case of the men, the elimination is greater in the small colleges, with the difference that for the women this greater elimination persists through the junior class. For all women the figures are as follows: For the sophomore class—median 65 per cent, middle 50 per cent within limits 52 to 81 per cent; for the junior class—median 44 per cent, middle 50 per cent within limits 29 to 64 per cent; for the senior class—median 42 per cent, middle 50 per cent within limits 30 to 55 per cent.

Probably the most interesting tendency indicated by these figures is the relatively small elimination in the last half of the course. The medians given above are in accord with the facts for the individual cases. There is a large elimination between the freshman and sophomore years. A somewhat smaller number drop out between the sophomore and junior years, while the elimination between the junior and senior years is relatively small. Taking into account the growth of colleges, which would tend to make these figures all too low, the fact of elimination might be expressed as follows: Of 20 men entering college, we may expect to find 15 of them in the sophomore class, 12 in the junior class, and 10 in the senior class.

From the data giving the ages of students the median age of men and women in the senior class was determined. It was assumed that the birthdays were evenly distributed through the year. The results are as follows:

Median age of senior class.

	Median age (M.).	Limits between which the ages of one-half the students are found (P. E.).
For all men	22 years 7 months	22 years to 23 years 3 months.
For men in colleges having more than 500 students.	22 years 9 months	22 years 2 months to 23 years 3 months.
For men in colleges having from 300 to 500 students.	22 years 5 months	21 years 11 months to 23 years.
For all women	22 years 2 months	21 years 6 months to 22 years 9 months.
For all women in colleges having more than 500 students.	do	22 years 2 months to 23 years.
For women in colleges having from 300 to 500 students.	22 years	21 years 3 months to 22 years 5 months.

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The ages given here should be increased by six months to get the age of graduation. It is interesting to note that if the age of entrance upon school life be taken as seven, and if one adds eight years for elementary school, four years for high school, and four years for college, the median age, 23, is the result. In other words, of those who get as far as the senior year in college, one-half of them do their school work in less than normal time, while the other one-half are for some reason somewhat delayed. It is noteworthy, however, that the range within which 50 per cent of the cases lie is very small, six months in either direction including 50 per cent of all the students.

The somewhat lower age indicated for women is probably not significant, since in institutions under similar control and having similar requirements the age for the women is practically identical with that for men.

CONCLUSION.

In conclusion it may not be out of place to call attention again to the fact that this bulletin has aimed mainly to present data that will be valuable as a basis for comparison among the several cities of the country. It is believed that such interpretation as has been suggested is correct for the whole number of cities considered. In any particular case, however, the final explanation of the situation can be had only by a careful study of the factors which determine the condition of affairs which is there found. In order to explain adequately the situation with regard to elimination and retardation in any particular city it is necessary to know the number actually entering school, the number promoted from each grade, the number of those promoted who actually enter the grade to which they are promoted, and the number demoted, as well as the ages of each of these groups for each of the grades. Any adequate investigation will involve certain other factors which necessitates a history of each child. Retardation may be due to late entrance, it may be due to mental immaturity which causes the child to repeat one or more grades, it may be because of illness or because of the frequent change of school, or it may be due to poor teaching. In like manner elimination from school may be brought about by a variety of causes, the most significant of which is probably failure to get along well with school work.

The study of the problem of elimination and retardation has brought us face to face with the necessity for changing our curriculum. It is manifestly unfair to provide a rigid curriculum which leads straight to the college or the university. Our schools are beginning to take account of the facts of individual differences in interests and in abilities. We shall have to modify our curriculum still

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further. During the first six years we may possibly be satisfied to accept a minimum of achievement from those who are less capable along the lines of traditional school work. Beyond the sixth grade we are already beginning to have a differentiation of courses of study which will enable the child who is to work in the fields of industry or commerce to secure from the school some adequate preparation for his life work. We are beginning to have, and shall have probably in still greater measure, special schools and special classes for those who are unusually deficient either mentally or physically. It is not less significant that special classes for unusually capable children are beginning to be established. The ideal of education in a democracy will be realized when it is possible for each child to work to the maximum of his capacity and to secure during those years devoted to school activity that training which will best fit him for his life's work.

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——— Irregular attendance—a cause of retardation. Psychological clinic, 3: 1–8, March 15, 1909.

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Such a book, at once readable and scholarly, scientific and popular, critical and constructive, is typical of the best in educational literature. (Independent, August 5, 1909, p. 311.)

"In the present study these questions have been kept constantly in view: Namely, What proportion of the children who enter the schools complete the elementary course? At what point in the course do those who fail to finish drop it? What are the causes which impel children to drop out without finishing?" (p. 216.)

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"Of the 15,587 children comprising first year classes of the last ten years [1896–1906] graduating from our high schools, only 67.56 per cent reached the second year, 47.69 per cent the third, 40.69 per cent the senior year, and but 33.75 per cent graduated . . . Of the 114,028 children enrolled in the first grade of the elementary schools of Cleveland [1892–1902] only 70.47 per cent reached the fourth grade, 58.84 per cent the fifth, 48.23 per cent the sixth, 36.29 per cent the seventh, and 26.32 per cent the eighth . . . 27.58 per cent of all the children of our elementary [schools] and academic high schools being behind grade from one to four years."

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H. C. Missimer, Superintendent.

This chapter is partly reprinted in the Ohio educational monthly, 58: 577–80, November, 1909.

"Of the pupils admitted to the high school in June, 1909, about 39 per cent finished the grade in seven years and less; 30 per cent finished in eight, and 23 per cent finished in nine years and over. That is, 77 per cent finished on normal time or less, and 23 per cent ran overtime from two to nine months."

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GRADUATE WORK IN MATHEMATICS IN UNIVERSITIES AND IN OTHER INSTITUTIONS OF LIKE GRADE IN THE UNITED STATES

INTERNATIONAL COMMISSION ON THE TEACHING OF MATHEMATICS

THE AMERICAN REPORT

COMMITTEE No. XII

WASHINGTON
GOVERNMENT PRINTING OFFICE
1911

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CONTENTS.

	Page.
Letter of transmittal	5
General report	7
The establishment of advanced instruction in the United States	7
Study abroad	8
The foundation of Johns Hopkins University	8
The elective system	9
The graduate student of mathematics at the present day	10
The organization of advanced mathematical instruction	12
Teachers	15
Study by Americans abroad	18
Report of subcommittee 1, on courses of instruction and the master's degree	20
Historical sketch	21
Organization and personnel	22
The graduate students	23
Courses of instruction	26
Methods of instruction	30
Requirements for the master's degree	32
Report of subcommittee 2, on preparation for research and the doctor's degree	36
Report of subcommittee 3, on the preparation of college and university instructors in mathematics	42
Survey of past conditions	42
Present-day conditions	44
The present preparation for teaching and its deficiencies	47
Supplement to the lecture system	50
Teachers' courses and teachers' colleges	52
The amount of graduate study	54
The supply and appointment of teachers	55
Concluding remarks	60
Index	63

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, April 14, 1911.

SIR: At the Fourth International Congress of Mathematicians, held at Rome in April, 1908, an international commission was organized to make a general study of the progress of mathematical instruction in the various countries. The formal resolution adopted by the congress was as follows:

> The congress, recognizing the importance of a comparative examination of the methods and plans of study of the instruction in the mathematics in the secondary schools of the different nations, empowers Messrs. Klein, Greenhill, and Fehr to form an international commission to study these questions and present a general report to the next congress.

The committee of organization appointed members of the general commission, representing the various nations, and the following general officers were elected: President, Prof. F. Klein, Geh. Reg.-Rat., Göttingen; Vice President, Sir George Greenhill, F. R. S., London; Secretary, Prof. H. Fehr, Geneva. The commission soon found that it was necessary to extend the scope of the investigation to include the teaching of mathematics in higher institutions and elementary schools, thus covering the entire field of instruction in this branch of learning, and this investigation is now proceeding simultaneously in all of the leading countries of the world.

The commissioners appointed to represent the United States are Prof. David Eugene Smith, of Teachers College, Columbia University; Prof. William F. Osgood, of Harvard University; and Prof. J. W. A. Young, of the University of Chicago. This commission has been enabled to carry on their investigation by the financial support of several gentlemen who are interested in the subject and of a number of our leading institutions of learning. The Bureau of Education has assisted the commission by securing information from various institutions in the United States. Nearly 300 individuals who are engaged in giving instruction in mathematics have cooperated in preparing reports setting forth the present status of the subject in this country. I have the honor to transmit herewith the first of these reports, entitled "Graduate work in mathematics in universities and in other institutions of like grade in the United States," and to recommend its publication as a number of the Bulletin of the Bureau of Education.

Very respectfully, ELMER ELLSWORTH BROWN,
Commissioner.

The SECRETARY OF THE INTERIOR.

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GRADUATE WORK IN MATHEMATICS IN UNIVERSITIES AND IN OTHER INSTITUTIONS OF LIKE GRADE IN THE UNITED STATES.

GENERAL REPORT.[1]

1. THE ESTABLISHMENT OF ADVANCED INSTRUCTION IN THE UNITED STATES.

Forty years ago the bachelor's degree granted on the completion of a four years' course of a general character marked not merely the close of a young man's liberal education, but also, except in the case of some lawyers, ministers, and physicians, the end of all academic instruction of any kind. In particular, apart from a few exceptional cases, no advanced instruction in mathematics was anywhere provided beyond the usually rather meager ingredients—hardly more than analytic geometry and a little calculus—of this college course, which consisted mainly of prescribed studies. As an external sign of this state of affairs we note that the master's degree, where it existed, was conferred for reasons having very little to do with study, while the doctor's degree was practically nonexistent.[2] The desire for higher education in America, which had been felt for many years by some of the leading minds of the country, had been able so far to achieve only momentary and sporadic success.

The most notable example of such a momentary success, so far as the study of mathematics is concerned, is to be found at Harvard during the fifties and early sixties, where, under the guidance of Benjamin Peirce, a band of young men devoted themselves successfully to the pursuit of higher mathematics.[3] A few of these have since attained world-wide fame, while others were influential in introducing advanced mathematical instruction into the United States 20 or 30 years later. Peirce's success in collecting at this time a fair number of competent students for graduate work seems to have been due primarily to the presence of the office of the American Nautical Almanac at Cambridge from 1849 to 1866, and, secondarily, to the found-

[1] No attempt is made in this report to summarize completely the reports of the three subcommittees or even to refer to all questions treated in them.

[2] Except at Yale University, where the degree of doctor of philosophy was established in 1860.

[3] Peirce was tutor or professor of mathematics at Harvard from 1831 till his death in 1880, but, except during the period here considered, it was only in the last ten years of his life that, under the influence of an expanding elective system, he again began to have an appreciable number of advanced students.

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ing in 1847 of the Lawrence Scientific School,[1] which, in those early years, possessed, under the leadership of Louis Agassiz, Jeffries Wyman, Asa Gray, and others, some of the aspects of what is now known as a graduate school.

We notice, in passing, the contrast presented at this time, and for many years after, between the increasing supply of good astronomers in this country and the lack of men who, even by a stretch of the imagination, could be called mathematicians. It may fairly be said that the mathematical talent of the country was at this time diverted to astronomy.

Various circumstances united to bring a large measure of success in the establishment of graduate instruction in all fields, and in particular in mathematics, during the years 1870–1890. The great increase of wealth in the country brought with it endowments of many sorts which strengthened the older universities and established some important new seats of learning. Three things may be mentioned which, on this basis of material prosperity, did more than anything else to help forward the cause of graduate study in the critical period we are now considering.

1. *Study abroad.*—For many years an occasional American had gone abroad to complete his studies. Thus B. A. Gould, a pupil of Benjamin Peirce and a graduate of the class of 1844 at Harvard, who later became eminent as an astronomer, studied with Gauss in Göttingen and took his doctor's degree there in 1848. Similarly J. Willard Gibbs after taking his doctor's degree at Yale in 1863 spent three years (1866–1869) in Paris, Berlin, and Heidelberg, where he studied with Kirchhoff, Helmholtz, Weierstrass, and others. A few more cases of a similar sort might be recorded, but it was not until the end of the seventies or the beginning of the eighties that the stream of mathematical students from America to Europe (generally to Germany) became a steady one. This tendency to go to Germany for the closing years of study contributed probably more than anything else to build up sound standards of productive scholarship and of graduate teaching, without which all attempts to establish advanced instruction in this country must have remained abortive. Its success was in part due to the establishment and the wise administration of traveling fellowships, first at Harvard and then, to a much less degree, elsewhere. We shall return to this important matter of study abroad in a later section.

2. *The foundation of Johns Hopkins University.*—The magnificent bequest of Johns Hopkins of $3,500,000 for the foundation of a uni-

[1] In the same year the department of philosophy and the arts was organized at Yale with the purpose of furnishing "resident graduates and others with the opportunity of devoting themselves to special branches of study," these branches embracing "theology, law, medicine, and more particularly mathematical science and physical science and its applications." It was in this department that the doctor's degree was established in 1860, as noted above.

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versity in Baltimore, and his wisdom in leaving his board of trustees a free hand in the organization of the institution resulted in the adoption, on President Gilman's initiative, of a plan whereby the ordinary undergraduate instruction was relegated to a subordinate position from the very start, so that the new university stood before the American public as the standard bearer of the higher education. This was of inestimable benefit in strengthening the hands of those members of the faculties of the older universities who had been struggling to establish and develop graduate instruction at their own institutions. The presence of the eminent English mathematician, Sylvester, as professor of mathematics during the first seven years of the Johns Hopkins University had also a marked effect in stimulating interest in advanced mathematical studies in America, though it is easy to overestimate his direct influence, as he was a poor teacher with an imperfect knowledge of mathematical literature. He possessed, however, an extraordinary personality, and had in remarkable degree the gift of imparting enthusiasm, a quality of no small value in pioneer days such as these were with us.

3. *The elective system.*—At the beginning of the period under consideration the lack of students qualified to undertake advanced work was most keenly felt and made any large success in the establishment of graduate instruction an impossibility. The adoption under the lead of President Eliot, first at Harvard and then to a greater or less extent throughout the country, of a far-reaching elective system in the four-years' undergraduate course furnished a possibility for the gradual extension of instruction in the special fields. Without entering on the question of the advantages and disadvantages of the elective system for the college itself, we may safely say that it provided a basis for advanced instruction without which any considerable development of such instruction, at least during the years of which we are now speaking, would hardly be conceivable.[1]

At the close of the period we are considering, when the idea of graduate instruction had already taken a firm hold on many of the stronger institutions of the country, the founding of Clark University exclusively for graduate study in mathematics, psychology, biology, physics, and chemistry gave a further impetus to specialization in advanced work, and the opening of the University of Chicago in 1892 may almost be said to mark an epoch in the development of graduate instruction in the West and Middle West; for, though that university had from the start an undergraduate department, it stood out,

[1] Cf., however, the closing remarks of sec. 2. What we desire to emphasize here is that an elective system so arranged as to allow some specialization in individual departments, not merely the choice between various *elementary* subjects, permitted a gradual development of more and more advanced instruction, the students being at first mainly undergraduates. *Such* a development could go on simultaneously at many places, while even a single attempt to duplicate the Johns Hopkins experiment would probably have quickly led to disastrous failure.

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through the character of its faculty and the emphasis laid on research work, as a strong exponent of the graduate idea.

While in these universities, as well as at Johns Hopkins, advanced instruction was at once placed in a department by itself, in by far the larger number of institutions it developed very gradually within the old college, room being made for it by the elective system; and it was only slowly, even in the larger institutions, that small groups of graduate students began to collect. The somewhat unorganized condition, which was then the rule, is still to be found in the weaker institutions of the country and also in some colleges which in their chosen field of undergraduate work are strong, but which voluntarily renounce any substantial development of graduate instruction. The great universities, however, have all, since the year 1890, developed well-organized graduate schools frequented by the graduates of their own and other colleges. It may be added, to avoid possible misconception, that the graduate schools which sprang full-fledged into existence and those which developed slowly from the old college no longer form two distinct classes. Some of the strongest graduate schools in the country are now to be found among the last-named institutions.

In contrast with such countries as France, Italy, and, to a less extent, Germany, we note the complete lack of central control or organization in the United States. Many variations are hereby made possible which are, for a country like ours, almost a necessity; and competition, on the whole healthy, springs up between the different institutions.

In conclusion we note that of late years some technological schools (for instance the Massachusetts Institute of Technology) have undertaken a limited amount of graduate instruction in mathematics. As this instruction does not differ, except in the greater emphasis laid on applied mathematics, from that given at colleges and universities, and since the amount of such instruction at technological institutions is as yet very small in comparison to the whole amount of mathematical graduate instruction in the country, we have not thought it necessary to mention these technological schools specifically in what follows.

2. THE GRADUATE STUDENT OF MATHEMATICS AT THE PRESENT DAY.

Owing to the great variety of standards for the bachelor's degree in the different colleges of the country, the students of a single graduate school enter it with very diverse preparation. This is, however, not so disturbing as might be expected, owing to the fact that at every university in which a graduate school exists there is a collegiate or undergraduate department whose instruction is freely open to the graduate student who is in need of it. We may then say that not all work done by graduate students is graduate work. On the other

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hand, the ambitious and capable senior in colleges allowing considerable freedom of election will frequently be doing work of a distinctly graduate character in the same classes with able graduates of colleges in good standing.

If we thus miss any sharp line of demarcation at the lower limit of the graduate school between graduates and undergraduates, we find a similar phenomenon at the upper limit where the graduate student often passes by almost imperceptible steps into the teacher. Indeed there are graduate schools, even among the better institutions of the country, the bulk of whose students are at the same time assistants or instructors. This, and the very high percentage of graduate students of mathematics the country over who are fellowship and scholarship holders are features of American education which, it is to be hoped, will gradually pass away.[1] They are closely related to the presence in graduate schools of large numbers of students of mathematics who have reached an age when their student days should be over. It can not be too strongly urged on all who give young men advice or who are influential, by awarding scholarships or otherwise, in shaping their careers that it is only in his first youth (not at the age of 30 or 35) that the foundation of real success can be laid by the student of mathematics.

A somewhat different class is formed by school-teachers in active service who are at the same time enrolled as graduate students of mathematics, but at any moment take necessarily only a small amount of work. The ambition of these teachers to improve their professional equipment is most laudable. When, however, as is sometimes the case, they form a considerable proportion of the enrollment of a graduate school, they may be a source of weakness to that school in spite of their earnestness of purpose.

The period spent by a student in graduate study varies from one to three, or even more years; and the amount of migration from one university to another does not seem to be large, although the great majority of students attend a graduate school at a different university from that at which their undergraduate years were spent.

We note also that in graduate work coeducation is the almost universal rule, not only in the great State and other western institions where coeducation forms an integral part of the scheme of education from top to bottom, but even in the most conservative institutions of the East, which do not admit women to their undergraduate departments. Apart from Princeton and the University of Virginia, where no women are admitted, it is only in women's colleges (Bryn Mawr, Vassar, etc.) and in some institutions for men which have held firmly

[1] Nothing in any way resembling this free award of financial aid is found necessary to induce strong men to attend schools of law or engineering. Cf. the closing lines of this section.

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to the undergraduate idea, so that the amount of graduate work is very limited, that one sex alone will be found.

A striking and significant fact is that nearly half of all graduate students of mathematics come from small colleges. This is probably due to the fact that in such colleges students always have the opportunity to study the elements of mathematics and often something beyond the elements, while the inducements for them to turn away into other fields are slight in comparison to those offered at larger institutions where a richer elective system prevails. The tendency so strong in our day and country to regard the man of action as being of nobler clay than the man of thought and ideas, reinforced by the much greater financial prizes open to the former, whether he be lawyer, business man, or engineer, creates a situation where it is not easy to secure for mathematical study a due proportion of the strongest youth in our college communities.

3. THE ORGANIZATION OF ADVANCED MATHEMATICAL INSTRUCTION.[1]

The purpose of mathematical instruction should be fourfold:

I. To impart knowledge.

II. To develop power and individual initiative.

III. To lead the student to express adequately and clearly what he knows.

IV. To awaken the love of knowledge and to impart scholarly ideals.

The first of these aims, without attention to which the other three can not be obtained, has led to the great development of the lecture system which we find in all graduate schools, and to the use of the textbook and treatise either in connection with these lecture courses or independently of them, and of the original memoir the reading of which constitutes an art by no means easy to acquire, and which deserves special cultivation at the hands of the members of the teaching staff.

As means used under II may be mentioned: First, the solution of problems by students either in connection with the lecture courses or in special seminars or proseminars, and secondly, the writing of theses which may or may not be connected with the doctor's degree. This last is also the chief means employed under III, although the quiz (cf. subcommitte 3, section 4) is sometimes employed effectively for this purpose, and even the brief written problem is not without some value here.

Both II and III above should receive more attention than is now commonly given to them, while I is at present adequately treated, except, perhaps in the relative weakness of applied as distinguished from pure mathematics.

[1] Cf. also the report of subcommittee 1.

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The aim indicated under IV depends for its attainment less on special methods of instruction and more on the personality of the instructor and his attitude towards science than do I, II, or III. To secure adequately the end in view, an instructor is needed who combines high *scientific* ideals with a commanding or sympathetic personality. Such men could do much to counteract the tendency noted in the closing lines of section 2, but, on the other hand, it is precisely this tendency which makes them difficult to secure. Their influence on undergraduate instruction should be no less valuable than in the graduate school.

We must come back once more to the lecture courses which everywhere form the backbone of graduate mathematical instruction. Such a course usually extends either through the whole academic year, that is from the end of September till early in June, or through the first or second half of this year.[1] The lectures, of somewhat less than an hour each, come usually three times (less frequently twice) a week. While much depends on the local traditions and the personality of the instructor, it may in a general way be said that these lectures have a far less formal character than is the case in European universities. Students will frequently interrupt the lecturer with a question, and short discussions between the instructor and one or more students will not infrequently take place, and at times the more formal quiz (cf. subcommittee 1, section 6, and subcommittee 3, section 4) finds its place here. Some tact and firmness are occasionally necessary to prevent the loquacious or thick-headed student from monopolizing the time of the class, but on the whole this frequent contact during the lecture between teacher and student is an admirable feature of American higher education, and counteracts, to a certain extent, some evils which usually accompany the lecture system. It is made possible by the smallness of the classes, an audience of 25 in a graduate course in mathematics being distinctly unusual.

The range of subjects covered by the courses offered in each graduate school is very great (cf. subcommittee 1, section 5). This is peculiarly the case in those institutions which have only recently begun a policy of expansion in their graduate work, where the first sign of such expansion often appears in an astounding increase in the number and range of courses offered, for only a small part of which there are students. Indeed, if students should present themselves, the capacity of the teaching force would be completely overtaxed. This is a state of affairs which no self-respecting institution should allow to continue, and there are signs that it is usually of only a temporary nature, since with a real strengthening of the mathematical department of such an institution this inflation tends to disappear. We

[1] Attention must also be called to work in the summer schools and summer quarters. Cf. subcommittee 1, section 4.

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hasten to add that the stronger institutions, and many smaller institutions with a due sense of proportion, offer admirable selections of courses commensurate with their capacity and the needs of their students, courses which at each institution usually vary considerably from year to year. Even in the weaker institutions where a call for advanced instruction is hardly apparent, it may often be wise to encourage instructors to offer a course of a not wholly elementary character, as it will frequently be found to act as a tonic and, by keeping them in touch with the scientific side of their subject, enable them to make their elementary work more vital.

It was mentioned in section 2 that no sharp distinction between graduate and undergraduate work in mathematics can be made. Indeed it is hard to exclude entirely from graduate work anything above the first course in the calculus, now commonly taken in the second undergraduate year. The actual state of affairs is best expressed by regarding the group of courses just following this point, such as a second course in the calculus, the elements of determinants and of the theory of equations, projective geometry, a first course on differential equations, etc., as belonging both to graduate and to undergraduate instruction. From this latter point of view, however, these courses usually appeal only to the student of distinct mathematical ability and seriousness of purpose, whose presence in the course along with graduates does not very greatly affect the character of the course.

As the external signs of success for the graduate student we have the master's and the doctor's degrees. The first of these is commonly given for one year's graduate work done largely in one subject, such as mathematics or physics, and tested either by course examinations in which a higher standard is demanded than is accepted for undergraduates, or by a single examination covering the whole year's work. A thesis is also often required for the master's degree; but the work done on this thesis is not commonly of the nature of research work, and the degree is taken by considerable numbers of students most of whom never proceed further. This degree is given, and properly given, by a large number of institutions, many of which have only a very moderate strength in their graduate mathematical work. Under these conditions suggestions for a minimum standard for the degree are not out of place, and such suggestions will be found in the report of subcommittee 1, section 7.

The doctor's degree originally came to us from Germany, but has long been naturalized and is in all American institutions of good standing distinctly a research degree. In several of our stronger universities it has a standard at least as high as the best German standard. The requirements for the doctor's degree in universities which have been given to any extent during the last 10 years are tolerably uniform (cf. the report of subcommittee 2), but in this matter so much depends on the unwritten standards of individual professors or

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departments that there still remains a great difference in the case with which the degree can be obtained at different institutions It is for this reason that the suggestion which is sometimes made that it would be well to attempt to formulate definite standards for the doctor's degree, to which the universities of the country should conform, seems to be of slight practical value.

In school and college work America adopts in one respect a very different standpoint from France and Germany, and this has a certain indirect influence on graduate work. We refer here to the fact that in the last-named countries a pupil will not be allowed to proceed from class to class, and, particularly, will not be allowed to pass the great educational landmarks (for instance graduation from the gymnasium in Germany) without conforming to a very exacting standard which a considerable percentage of each class fails to attain. In America, on the other hand, the teacher who tries to impede seriously the progress of any but the unusually lazy or stupid soon makes himself impossible. This is not the place to discuss the respective merits of these two points of view in the secondary school or even in the college; but when we come to the graduate student of mathematics it seems clear that the American attitude must be modified, and, as a matter of fact, in all the stronger institutions of the country a much greater ability and earnestness of purpose is demanded for passing examinations and securing degrees in the graduate school than would be allowed to pass muster in undergraduate work. Nevertheless, it is to be hoped that something more will be accomplished in this direction, and that, in particular, candidates for the doctor's degree will be made to feel that success for them at an institution of good standing is not a mere matter of time and patience. It is the more important to insist on this, since, as has just been said, the whole current of secondary and college education runs in another channel.

4. TEACHERS.

We must be concerned with this subject for two different reasons, first, because the great majority of graduate students of mathematics ultimately become teachers in secondary schools, colleges, or universities; and, secondly, because on the quality and efficiency of the teachers in the graduate school itself (professors, instructors, etc.) depends to such a large degree the quality of the school.

It is a favorable sign of the gradual elevation of the profession of secondary-school teacher that of late years many persons wishing to adopt this profession spend a year in study in a graduate school. It is true that this time is frequently not spent in the study of a single subject; but for the future teacher of mathematics (or of mathematics and some other subject) to have had a couple of graduate courses in mathematics, usually in the intermediate group referred to on page 14, is a very substantial gain over the conditions of 20 years

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ago. It is to this class of students that the courses on the teaching of mathematics, which are now given at many colleges and universities, mainly appeal.

If we except this group who go into secondary-school teaching, and a second group who study mathematics as a tool for use in some other science, such as physics, it may be said with almost absolute precision that all other students of mathematics in graduate schools become instructors in mathematics in colleges or universities. The condition of 25 years ago, where college instructors in mathematics were taken from among the freshly graduated students of a college (usually the same college where they were to teach), has now become the exception instead of the rule; and where it still occurs, the appointment is usually a temporary one, both the instructor and the college expecting that, after a year or two of teaching, further graduate study will follow. The gain involved in this changed state of affairs, both in breadth of view and in real mastery of the subject, the teaching of which is to be the young man's life work, is so obvious as to require no further comment here. If the student can furthermore be given some comprehension of the fact that the science of mathematics is a living and growing one through contact with other students or instructors who are themselves contributing to this growth, and still more if he himself can take some part in the development of mathematical knowledge, his outlook on mathematics in particular and intellectual life in general will have been so broadened that he can hardly fail to become a better member of a college faculty than would otherwise have been the case.

After all this has been said, we must, however, admit that this question has also another side less pleasant to contemplate. What passes for original research, in this country more even than abroad, is often hardly a real contribution to mathematical progress at all, but merely a grinding out of results, which if they have only never been published before may be as unimportant and unattractive as you please; they form an "original contribution." One is tempted to answer, Yes, in the same sense as the brass button in the contribution box. We may feel certain that in the long run this will be the character of the research work done by students who have no real capacity or inclination for original work, but who are pushed into it by the increasing demand, on the part of certain heads of departments, for the doctor's degree as a necessary preliminary to college teaching. The pressure thus produced will surely, if persisted in, bring forth an increasing yearly crop of doctors—success can be obtained by almost anyone with a fair mathematical capacity and with sufficient industry and patience, either by going abroad or by going to one of the weaker American institutions with an ambition for giving the doctor's degree. It is doubtful if the time will ever come, certainly it will not come for a great many years, when all the members of the teaching staffs of the

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large universities of the country, and the colleges of like rank, can be men with a real capacity for original investigation; the number of all such men in the country falls far short of (one might almost say that it is of a different order of magnitude from) the number of places to be filled.

The pseudo doctor, to whom reference was made above, is often narrowed rather than broadened by the bit of investigation which he has been set to do, and becomes thereby less effective as a teacher, investigation for him becoming a fetich for which he forgets all other ideals. Or, on the other hand, he may let all thought of original work drop out of his mind when once he has secured his degree. In either case the letters he places after his name ought not to go very far in recommending him for teaching positions. A broad and deep mathematical training should surely be demanded by all the institutions of the country which claim collegiate rank as a prerequisite for a permanent appointment on their teaching staff. They will naturally demand also some ability as a teacher. If in addition they can secure an investigator of a genuine sort, even though his caliber be slight, they should usually regard themselves as fortunate, though a few of the strongest institutions can and should set themselves a much higher standard. On the other hand, our stronger graduate schools should continue, as they are now doing, to encourage every capable student to try his hand at some piece of original investigation, but they should not hesitate, after a fair trial, to tell him, if that turns out to be the case, that he is not fitted for that kind of work.

No specific training for the profession of college or university instructor is commonly given in graduate schools apart from the training in mathematics (cf. subcommittee 3, section 5). The statement made in section 3 of the present report that the training in clear and adequate exposition which is given to graduate students of mathematics is frequently insufficient is of peculiar importance in relation to the future teacher. While it is probably not desirable to attempt to train the future college or university instructor in the art of teaching, the question whether more can not be done to lead graduate students of mathematics to express their ideas well both in spoken and in written form is worthy of serious consideration.

Let us turn now from the graduate students, who are to become college instructors, to the actual instructors and professors of mathematics in our colleges and universities. If we compare conditions at the present day with those existing 20 years ago, a very great increase in the standard of mathematical knowledge on the part of the teaching staff is evident. That the improvement here has not been even greater is due in large measure to the fact that the supply of well-trained graduate students falls far short of the demand. Weak appointments are also made from time to time, owing to ignorance on

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the part of trustees or heads of departments of what really constitutes a mathematician, to the pernicious view that administrative ability may be allowed to take the place of mathematical ability, or to other like causes. Flagrant cases of this kind occasionally occur which make one blush for the good name of American universities, but such cases are now merely sporadic and one gains comfort by contemplating conditions in Germany only a hundred years ago. What is needed here, as in so many other places in American life, is a strengthening of *intelligent* idealism (we have more than enough misdirected idealism amongst us) based upon knowledge, and there seems every reason to hope that the great development of mathematics in this country during the last 20 years, evident chiefly in the growth and activity of the American Mathematical Society, will in an ever-increasing degree supply the intelligent and influential public opinion here needed. The shortage, above mentioned, in the supply of instructors in mathematics forms the most serious aspect of the situation.

For various further points: The excessive burdening of young instructors with drudgery, which still often occurs; inadequate salaries; the burdening of professors with administrative work; we refer to the report of subcommittee 3.

5. STUDY BY AMERICANS ABROAD.

No account of higher mathematical education in America would be complete without a reference to the part played by the study of Americans abroad. What an important factor this was in introducing advanced mathematical instruction and research into America has already been mentioned in section 1. In the early days the possibilities for advanced mathematical study in this country were very limited, so that it was natural that students able to do so should go abroad where they could find this opportunity in large measure. At the present day it may safely be said that at several of the stronger American graduate schools most American students find mathematical opportunities better suited to their needs than are to be found at any place abroad. Nevertheless, students still go abroad in apparently undiminished numbers to study mathematics,[1] and their decision

[1] It would be a matter of considerable interest to have statistics on the number of American students who go abroad each year to study mathematics and the length of time they stay. Such statistics would seem to be very difficult if not impossible to secure. As to the proportion of instructors of graduate courses in mathematics who have spent at least one year abroad, see the report of subcommittee 1, section 3. Far less important is the question of the number of doctor's degrees conferred on Americans abroad. Such information might be secured. We content ourselves with giving two such items, for which we are indebted to Dr. Dunham Jackson:

At Göttingen in the years 1889–1909, inclusive, 22 Americans received the degree in mathematics, while no degrees in mathematics had been conferred on Americans during the four previous years.

At Leipzig in the years 1885–1902, inclusive, 8 Americans received the degree in mathematics, while after this time Americans seem to have ceased taking the degree in mathematics there.

At present from 2 to 4 Americans take their degree in mathematics in Germany each year, as against an average of 16 or 17 in the United States.

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to do this is frequently a wise one. Let us inquire how this can be the case.

There come first considerations of a nonmathematical character. It is desirable for everyone to become acquainted at first hand with other countries than his own, and this is doubly true for an American, for whom a period of residence in European countries is invaluable. It is true that the student often seems to have brought back from a year or two of residence abroad only a strengthening of his earlier national prejudices, since the mote in the neighbor's eye is so very easy to discern;[1] but if he is worth his salt, he brings with him a fund of impressions and experiences which, as time goes on, greatly enrich his life. For this reason alone study abroad is to be recommended even at some mathematical sacrifice. A second consideration is that the cost of living in Germany, to which country the great majority of students going abroad have always resorted, even after the great increase of the last few years, is still lower than in America, and in particular, the tuition fees are much less than in many of the larger American institutions, especially of the East. These facts largely counterbalance the expense of the trip across the ocean. Finally, it is to be remembered that a year or two of mathematical study in Germany, France, or Italy gives the student a reading and speaking knowledge of one of the great languages of modern thought, besides his own native English, such as can hardly be acquired in any other way.

When we come to mathematical considerations, the first question we must ask is whether getting a degree or learning mathematics is the prime object of the student going abroad. It is the former which, owing to circumstances mentioned in section 4, is too often uppermost in his mind. A student of this category had much better go abroad for his degree than to a second-rate American institution. Of course some care must be exercised by him in the choice of his university, or he must have good fortune in writing a thesis whose weak points are not evident on a superficial examination, but his task is, on the whole, not a difficult one, and he gets at least the advantage of a period of foreign residence.

For another class of men foreign study may be recommended without qualification, namely, for able students who have already had a substantial training in one of the better American graduate schools, or who have even taken the doctor's degree at such a school. Such men will naturally go either to one of the great mathematical centers like Paris or Göttingen, where they will have the opportunity to hear lectures by several of the leading mathematicians of the day, and, perhaps, to see some of them occasionally outside of the lec-

[1] There are also cases in which he takes so kindly to foreign conditions as to become out of touch with America. It is, however, rare that this state of affairs should survive his return more than a few months.

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ture room; or they will select some mathematician of eminence in a particular field with whom they may hope to gain direct personal contact, and go to the university where he happens to be. Thus of late years a small but steady stream of American students has gone to Italy.

To the students just considered, and to some extent to their weaker comrades mentioned above, the period of residence at a great European mathematical center or of contact with an eminent mathematician at a less important European institution brings with it a realization of what high scientific ideals in mathematics are, and to what an extent they prevail abroad. Such ideals prevail also, it is true, at the strongest American institutions; but it is hard for the young American to appreciate their great diffusion in a ripened civilization until he has experienced it by personal contact.

REPORT OF SUBCOMMITTEE 1, ON COURSES OF INSTRUCTION AND THE MASTER'S DEGREE.

In preparing this report the committee has found the greatest difficulty in securing reliable information on the various topics considered. Nothing of the kind has been attempted since Cajori's report of 1890, "On the teaching and history of mathematics in the United States."[1] Valuable as this is, it covers only the period of the beginning of graduate study; and except for two brief statistical notes in the reports of the United States Commissioner of Education and scattered items of information in the Bulletin of the American Mathematical Society, there exists no published information on the development of graduate instruction in mathematics since 1890. The committee has, therefore, been compelled to gather its material almost entirely at first hand, relying mainly on personal correspondence and on statements contained in catalogues and other publications of American universities. It is needless to say that only a limited amount of information can be obtained in the former way, while as for the latter, it is too frequently the case that the facts desired are either very hard to get at, or are not given at all.

Over 30 colleges and universities in the United States offer graduate work in mathematics, but less than 15 have given a doctor's degree in that subject within the last five years. The following 24 offer courses of an advanced character and report three or more graduate students for the year 1908–9: Bryn Mawr, California, Chicago, Cincinnati, Clark, Colorado, Columbia, Cornell, Harvard, Illinois, Indiana, Iowa, Johns Hopkins, Michigan, Missouri, Nebraska, Northwestern, Pennsylvania, Princeton, Leland Stanford, Syracuse, Virginia,

[1] United States Bureau of Education, Circular of Information No. 3, 1890.

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Wisconsin, Yale. To this somewhat arbitrary list the greater part of the statistics of this report refer, but even in the field thus limited it has been impossible to obtain entirely reliable information on all the points covered. Accordingly, though the numerical statements here given are believed to be in the main correct, it has seemed best not to give detailed statistics for any particular institution.

1. *Historical sketch.*—Genuine graduate work in mathematics may be said to date from the founding of Johns Hopkins University, and the assumption of his duties there by Sylvester, in the year 1876–77. It is true that courses of an advanced character had previously been given in various institutions, notably at Harvard, where Benjamin Peirce taught for nearly 50 years and exerted a profound influence on American mathematical development; but this earlier work was never of an exclusively graduate character, and was carried on with frequent interruptions due to the lack of properly prepared students.[1] Johns Hopkins was founded primarily as a graduate school and that department has always overshadowed the college. Its great success proved a powerful stimulus to advanced work along all lines in this country and led ultimately to the founding of separate graduate departments in most of the leading American universities.

The group of 8 or 10 whom Sylvester soon gathered about him, and their successors, carried something of their master's enthusiasm with them when they went out to other institutions, and in the course of a few years advanced instruction in mathematics was begun in a number of other colleges and universities. Almost as important were some of the indirect results of this influence; although the development at Harvard was independent of the Johns Hopkins movement, it is significant that this was also the period when graduate work in mathematics was there placed on a permanent basis.

The course of lectures delivered at Johns Hopkins by Cayley in 1882 had 14 regular attendants, and added materially to the force of this movement. After Sylvester's departure in 1883, his pupils and associates continued his influence. Cajori reports nearly a dozen institutions in which graduate instruction was offered in the decade 1880–1890. Among them he mentions specifically Harvard, Cornell, Princeton, Virginia, South Carolina, Texas, Michigan, and Wisconsin, as well as Johns Hopkins, and indirectly refers to the work at Yale.

After the departure of Sylvester and Cayley, it was natural that the more ambitious students should wish to continue their work under other mathematicians of the same order. Hence we find that by 1885 a number of Americans were studying in Europe, mainly in

[1] Exception may here be made of the work of Gibbs and Newton at Yale in applied mathematics. The former conducted strictly graduate courses yearly, beginning in 1871.

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the German universities. It was no new thing for an American to receive a doctor's degree abroad, but up to this time such cases had been relatively few. From 1885 to 1893, however, American mathematical study continued more and more to derive its inspiration from the seminars of Leipzig, Berlin, and Göttingen. The period of English influence was replaced by one in which a German training was the greatest desideratum, and if a single man is to be designated as Sylvester's successor, it is probably correct to say that the majority of Americans who studied mathematics in European universities received their training at this time in the seminar of Klein. This period was marked by the institution of strong mathematical departments in the newly founded Clark University (1889) and the University of Chicago (1892), and culminated in the International Mathematical Congress held at Chicago in 1893 during the World's Fair, and Klein's Evanston lectures.

By 1893 Americans trained abroad had become an influential, and later a controlling element, and from that time American mathematics stood on its own feet. At present doctor's degrees in mathematics obtained each year at home and abroad are about in the ratio of 5 to 1. It is, however, true that many still go to the great universities of Europe, and it will be shown in a later section of this report that at least half of those giving graduate instruction in this country have studied abroad.

2. *Organization and personnel.*—At present practically all of the leading American universities have organized their graduate work into a separate school or college. With two or three exceptions, however, there is no division of the teaching force into graduate and undergraduate faculties. In particular, the same department of mathematics gives both advanced and elementary instruction, though not all its members may participate in the former. The number of those who give no undergraduate courses is very small. The work of the department is usually directed by one of the professors, designated as the head or chairman.

An examination of publications of the 24 institutions mentioned in section 1 shows that the total mathematical teaching force, not including student assistants, was 202 in the year 1908–9. Of these, 136 offered advanced courses, but probably a considerably smaller number actually gave such work, since it will appear in section 4 that the total number of graduate students specializing in mathematics at these institutions was less than 250. It thus seems that only about half the total teaching force at these institutions had a part in graduate instruction. It should be added, however, that in a number of cases large technological departments necessitate a great amount of elementary mathematical work and increase the number of in-

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structors who must devote all their time to such courses. In only two or three institutions was advanced work given by every member of the department.

A further inquiry as to the amount of advanced work given by the 136 mentioned in the preceding paragraph shows that 45 undertook courses announced as primarily for graduates amounting to more than three hours per week. In only five universities were there four or more men offering more graduate work than this, while in 10 there was either only one, or else no member of the department offered more. It thus appears that the greater part of advanced instruction is in the hands of about one-fifth of the total teaching force. Naturally these are the older men, as a rule, but it is also evident that a considerable number of others give a limited amount of graduate work. In many institutions each of the younger instructors offers a single graduate course.

In the past the complaint has frequently been heard that American professors are overburdened. That this is still the case even with men giving a considerable amount of advanced work is evident from the fact that 9 of the 45 just mentioned have a teaching schedule of from 14 to 16 hours a week. However, there has undoubtedly been an improvement of late in this respect, and the average for all the 45 is about 11 hours per week—a figure that still leaves much to be desired.

As to the preparation of those announcing graduate courses, it appears that nearly five-sixths have obtained the doctor's degree, and probably half of the remainder have had an equivalent training. The instructional force would thus seem to be well equipped. More than half have received training in European universities; a partial list of those who have spent at least one year abroad shows 50 who have studied in Germany, 14 in England, 5 in France, and 1 in Italy.

There is a marked tendency in some of the older universities to recruit their teaching staff from their own students. Even when a period of residence elsewhere has intervened, such a practice has some disadvantages, but it also tends to give a permanent character to the work of the department.

3. *The graduate students.*—It may be said generally that the one prerequisite for status as a graduate student in an American university is the possession of a bachelor's degree. In many cases it is announced that this degree must have been given by an institution of equal rank, but as a matter of fact this stipulation is almost never enforced. The result of this is that there is no uniformity of preparation among those classed as graduate students, and frequently such men are taking work as elementary as the first course in the calculus. There are usually, however, more definite requirements to be fulfilled for admission to candidacy for a master's or a doctor's degree, but some

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institutions make no distinction of this sort and none require all graduate students to qualify as candidates for those degrees. In view of the wide range of attainment which presents itself among those classed as graduate students, statistics on this subject have only a relative value.

Another difficulty that arises is in the estimate of the work of the summer schools which have sprung up in the last 15 years in connection with most of the larger institutions. Many of these have an attendance of from 500 to 1,500, a considerable proportion being teachers in secondary schools. The instruction is given by regular members of the university, or others specially engaged. The brief duration of these sessions, usually six weeks, and the fact that this is vacation work, very often bring about a serious lowering of standards. Usually only a small amount of advanced work is offered,[1] and the published lists of students give no clue as to the number taking mathematical courses. For this reason we shall here attempt to give no statistics as to graduate work in summer schools beyond the statement that 10 institutions out of the 24 appear to give such courses, and that at least in two or three western institutions the enrollment in these classes is larger than the registration in regular advanced work.

The total number of graduate students in attendance on mathematical courses for more than one term or quarter of the year 1908–9 was probably about 400. The 24 institutions especially investigated report 295, but many indicate only the department in which major work is carried, so that a considerable number specializing in physics and astronomy are not included in this figure. It is easier to obtain a fairly reliable estimate of how many have mathematics as their primary subject. The institutions mentioned report 225, not including summer students and those enrolled for only one term or quarter. Possibly 25 more should be added for universities outside this list, making a total of 250, a number less than twice that of instructors offering advanced courses. It may be interesting to note that 40 of the above-mentioned 225 were women. Only two of the leading universities now restrict their graduate attendance to men.

In this connection it would be highly desirable to present some statistics on the growth of graduate work in mathematics and its relation to the growth of graduate study in general. Unfortunately, little is to be found bearing on this point. In the report of the United States Commissioner of Education for the year 1896–97 (vol. 2, p. 1649) the number of mathematical students in 24 institutions is given as 247

[1] The summer quarter at the University of Chicago differs considerably from the summer session in other institutions in that it is of equal duration with each of the other three quarters, and is in other respects the same except in the character of the attendance. It is, however, divided into halves, and many students attend for six weeks only. It may be noted that the number of graduate students in mathematics enrolled in this one session is three times the average registration for any other quarter.

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out of a total graduate enrollment of 3,204, but this probably includes summer registration and students specializing in other subjects. Since that time the number of graduate students in all departments has more than doubled, and mathematics would seem to have very nearly kept pace with the general development. In 1904 the same authority (vol. 2, p. 1424) gives figures for 10 institutions, showing 184 graduate students specializing in mathematics, inclusive of about 80 in summer sessions. This total has been increased by nearly 40 per cent in the last five years. It appears, however, that most of this recent growth has been confined to three or four institutions. Columbia reports an increase of over 300 per cent, and there has also been noteworthy development at the University of Illinois, large sums having been appropriated for the graduate school within the last two or three years.

Another indication of the increase of graduate students is afforded by a statement in the Bulletin of the American Mathematical Society (vol. 16, No. 2, p. 95), in which the number receiving the doctorate in mathematics from American universities in each of the last 11 years is given as 13, 11, 18, 8, 7, 14, 21, 11, 13, 22, 15. It may be noted that the average for the first three years is nearly six-sevenths that of the last three. Since regulations affecting the doctor's degree are not generally more stringent than they were 10 years ago, and no larger percentage of Americans are now studying abroad, these figures lead one to inquire whether advanced work is really increasing as fast as the enrollment would indicate. It is possible that special courses for teachers have largely swelled totals without materially adding to the amount of research. Another cause for the small and apparently decreasing percentage of doctorates may be the great demand for teachers of mathematics, due largely to the recent growth of technological work. This pressure has probably led many to discontinue their studies earlier than they would otherwise have done. Some light is shed on this point by the fact that in the year 1908–9 about 60 took the master's degree with mathematics as a major subject. Probably most of these had that degree only in view and terminated their graduate work as soon as it was obtained.

The bulk of advanced work is done by students receiving financial aid or on salary as subordinate members of the teaching staff. To be more specific, out of the total of 225 in the institutions mentioned, 57 received fellowships and scholarships, paying from $100 to $800 per year, and 61 were assistants or instructors. We may safely assume that a considerable proportion of the remaining 107 were secondary teachers or others taking but one course. There would thus seem to be relatively few giving the major part of their time to study without remuneration, and in fact only four institutions of the 24 have as many as six students of this class. The large number of assistants and instruc-

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tors in graduate classes gives a hint of what is often a most unfortunate state of affairs. These are men who should be devoting all their time to graduate study, but they are usually so loaded down with class work as to be unable to do justice to the courses they attempt to carry, and so poorly remunerated that they can not save enough to provide for the additional year or two of research work necessary for the doctorate.

An examination of the migration of graduate students of mathematics develops some very interesting facts. In the institutions mentioned 70 per cent received their bachelor's degree at another college or university, and about 50 per cent received their undergraduate training at other places not on that list. One may gather that there is no great disposition among students in universities maintaining advanced work to go elsewhere for further study after receiving the bachelor's degree, but that there is a large flow from the small colleges to the graduate schools. This movement is a source both of strength and weakness to the latter; of strength from the constant accession of fresh and in the main good material; of weakness in that the preparation of many of these men is very defective. Only 25 per cent of the total enrollment had previously taken graduate work elsewhere, from which it appears that there is relatively little migration after graduate status has been attained.

4. *Courses of instruction.*—Before considering specifically the nature and extent of the courses offered, we will briefly indicate the limitation of their field. Only two institutions have separate departments for applied as distinguished from pure mathematics. Another assigns such work to the department of astronomy, but it is more usual to include courses of this kind under the head of physics. Frequently the field of this latter department has no clear demarcation from that of mathematics; in general, courses in mechanics and mathematical physics are offered by both departments, with some resulting duplication. This report will cover only the work specifically listed as mathematics.

Courses beyond the first year in calculus are nearly always announced under two headings, introductory and advanced, often styled, "for undergraduates and graduates," and "primarily for graduates," respectively. Although, as indicated by their title, courses of the former group are attended largely by undergraduates, a considerable proportion of the graduate enrollment is also to be found here, so that they properly form part of the field of the present report.

The American university is apt to be distinctly liberal in its announcements; thus we find institutions with relatively small equipment offering from 15 to 25 courses in the two groups, and, in fact, the average for the 24 mentioned is about 20. It should be added that in many cases it is stated that these courses are offered in alternate

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years, but too frequently the lists are padded and no indication is to be found as to exactly what work was done in a given year. Something less than half the courses announced seem to have been conducted in 1908–9, about one-third of these being of the first group. We may note that the number of courses was thus about the same as that of graduate students, so that the average enrollment per class must have been very small.

The figures that have just been given clearly indicate the ambition of American universities to become centers of graduate study, and raise the question whether in many cases too much is not attempted on too little capital. It would seem that a concentration of advanced work in a dozen or so institutions would be a distinct gain, and that economy in the number of courses might in many cases be advantageously practiced. Often a course is given, not because it is needed, but in order that certain members of the department may participate in graduate instruction. There are, however, several institutions among the 24 mentioned which wisely limit their work to a fairly complete list of courses in the first group, and to but four or five each year of the more advanced sort. In such cases an adequate training for the master's degree is aimed at, but students who wish to go further are urged to continue their work at one of the larger centers of graduate instruction.

Naturally there is much diversity in the classification of subjects under the two groups; thus we might expect Harvard, which encourages an unusual amount of specialization in the undergraduate program, to include in the first group such courses as quaternions and vector analysis, infinite series, special topics in higher algebra, and theory of numbers. Differential geometry is similarly classed at Yale, Michigan, and Wisconsin, as well as one or two other institutions, while about the same number place in this group a first course on the theory of functions.

As already indicated, much of the work in applied mathematics is left to the department of physics. This is particularly true of introductory courses. Only 9 institutions of 23 whose practice was ascertainable announced under the head of mathematics a first course in analytic mechanics. Eight offered a second course in mechanics under the first group, but in only five cases was this given. It is, perhaps, more to be expected that celestial mechanics should be offered as a mathematical subject in but two institutions.

There is substantial agreement in classing the following subjects under the first group: Advanced calculus, advanced analytic or projective geometry, solid analytic geometry, determinants and the theory of equations, and an introduction to differential equations. The first two are almost always year courses, while the others are more often of half that length. The extent to which these may be

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considered standard subjects is indicated by the fact that but one institution on the list fails to offer a course in advanced calculus, and in only one other instance was such a course not given, if we accept the evidence of catalogues; and practically the same is true of the second-named subject. Three failed to offer the third and the same number the fourth as separate courses in the group, though we may suppose the subjects to have been included elsewhere, while the last was everywhere listed, either by itself, or in a few cases as the second half of the course in advanced calculus; and in only a few additional cases were these courses not actually given.

Though there is thus seen to be a considerable uniformity as to introductory subjects, it is interesting to note some of the variations from the more usual lists. Five courses in the history of mathematics are announced, three in probabilities, one in finite differences, six in statistics and insurance, and one in the theory of envelopes. Harvard and Iowa combine algebra with projective geometry, and as noted above, in some cases the first course in differential equations is given as a part of advanced calculus. There would thus seem to be evidence of a tendency to consolidate the introductory work into as compact a group as possible, and this tendency is probably on the increase.

The establishment of special honor courses similar to those of Oxford and Cambridge has been much discussed of late, and has been recommended in recent reports of several university presidents, but so far Princeton alone has adopted such a system. This movement, though of great interest, will not be further described here, as it at present concerns undergraduates only.

In the consideration of the group of advanced courses it will be useful for some purposes to introduce what may appear to be an arbitrary distinction in classing institutions; those which gave more than six courses of this kind will be placed together, while the others will be regarded as constituting another division. As a matter of fact, however, this corresponds to a real difference in the character of the work undertaken; the 13 universities of the former class all have candidates for the doctor's degree among their students, while this is true of almost none of the others. As might be expected, a majority of the institutions giving more than six advanced courses are to be found among the older universities of the East.

As to subject matter, we may note that nearly everywhere by far more emphasis is placed upon analysis than upon algebra, geometry, or applied mathematics. In but one institution of the first division are more courses given in any one of the last three subjects than in analysis, and the same is true of the class enrollment. As to the relative attention paid to the other branches, this varies widely, depending chiefly on the special interests of members of the department.

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Only two institutions of the first division leave all work in applied mathematics to other departments, and but two fail to offer courses in both geometry and algebra. We may conclude that there is generally a conscious effort to give a balanced curriculum, with especial emphasis on such subjects as the teaching staff is best prepared to offer. With institutions of the second division an even distribution of each year's work is, of course, impossible. Most of them, however, vary the courses given from year to year so as to include as wide a field as possible. In a few cases this seems to be only a matter of intention, and the courses actually conducted are confined to the subjects most interesting to the two or three men who have charge of graduate instruction.

All the universities of the first division include in their program from two to seven research courses or seminars, while none of the others has more than one. As this matter lies in the field of another committee, it will not be further discussed in this report.

Both in institutions of larger and of smaller equipment the practice of varying the program from year to year prevails. This is obviously a necessity where the enrollment is small. A number of the universities of the second division make it a rule never to repeat an advanced course in successive years, and this seems also to be true of at least three of the first group. In only two or three institutions are there more than four courses repeated year after year, and even in these cases the subject matter is seldom exactly the same. By far the most usual method of announcing courses consists in grouping them in pairs, sometimes from the same field but often widely differing in nature, offered by the same instructor in alternate years. Several institutions announce all of their work in this way. In a few cases more extended sequences are offered in which the cycle consists of more than two years. The effort thus shown to give variety to the work of the teaching staff and to cover as broad a field as possible is in the main most commendable, but it sometimes leads to the giving of advanced courses by men who may be qualified to do work in certain lines but are obviously unprepared for what they undertake.

Although there is a marked tendency not to devote whole courses to special topics, and one may note a certain conservatism in choice of subjects, most institutions offer at least one course in some comparatively narrow field, frequently one of recent development. Thus we find integral equations (given by three institutions) as well as point sets, divergent series, functional equations, modern theories in geometry, general analysis, differential invariants, linear systems of algebraic curves, imaginaries in geometry, symmetric functions, elasticity, and capillarity. Advanced courses in insurance, probability, and statistics appear in three announcements In two instances

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the influence of Sylvester probably accounts for such subjects as the logic of mathematics and principles of mathematics.

Although this may encroach somewhat on the field of another committee, we may at least mention here the courses offered specifically on the teaching of mathematics. As might be expected, these differ widely in nature. We shall not here enter into their character, but merely report that all but seven institutions of the list offer work of this kind.

This section should not be concluded without some reference to the courses of lectures delivered by distinguished foreign mathematicians on various occasions within the last 30 years. It is true that comparatively few graduate students heard them, but the influence of Cayley's course has already been indicated, and the visits of Klein in 1893 and 1896 were probably no less important. Of late a number of such courses have been given, and the exchange system may possibly lead to further developments along this line.

5. *Methods of instruction.*—Practically all the work, both introductory and advanced, considered in the preceding section is given by means of lectures of a little less than an hour in length. Sometimes seminars or research courses meet for two consecutive hours. By far the most usual program consists of three lectures a week, but three or four institutions prefer two-hour courses; very few classes meet but once a week, or oftener than three times.

A questionnaire on methods of instruction was sent to 18 of the 24 institutions previously mentioned and replies were received from the following: Bryn Mawr, California, Chicago, Columbia, Cornell, Harvard, Illinois, Michigan, Missouri, Northwestern, Pennsylvania, Princeton, Wisconsin, and Yale. It appears that on some points there is a considerable diversity of practice, even among instructors in the same institution, for freedom of instruction is, fortunately, almost everywhere carefully preserved. However, in most cases the answers received stated that the department used substantially uniform methods.

The first question concerned the assigning of courses to the members of the department, and was put in the form, Are standard courses (the theory of functions, for example) given by the same or by different instructors each year? Only two answers indicated that the latter alternative was the rule. Two more, however, stated that a change in this direction was probable, while four indicated some variation in practice. The custom of permanently assigning certain fields to certain men thus seems to be distinctly in favor. In spite of the advantages of such a system it is undoubtedly true that in many cases it is carried too far, so that a subject comes to be considered a particular instructor's preserve, not to be trespassed upon.

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An inquiry into the matter of examinations reveals two widely differing conceptions of graduate work. On the one hand, the practice of Harvard, for instance, in requiring searching written examinations at the end of each semester indicates a general system of careful supervision, while Columbia, Princeton, Chicago, Bryn Mawr, and California, which, it seems, ordinarily give no course examinations, represent the opposite extreme, where the student may take or leave the intellectual repast spread before him. Two or three other institutions allow oral examinations, and in some cases there is a difference of rigidity in the conduct of introductory and advanced courses. It appears that Yale, Harvard, Wisconsin, Northwestern, and Missouri represent the maximum of strictness in requiring written semester examinations. It is hard to determine any tendencies in this matter.

Another question that has a similar bearing concerns the giving of grades indicating excellence of work, a custom which prevails in undergraduate courses in American universities. The answers received show that the opposite practice is most usual in graduate work, but Harvard, Wisconsin, Chicago, Illinois, and Northwestern report that such grades are given.

To the query, Are problems assigned for report from time to time? an almost universal affirmative was returned, so that it would seem incorrect to conclude that anywhere is the student expected to be merely a hearer of lectures. It appears that in some courses in Columbia and Chicago this may have been the case, but the universal rule elsewhere is to require reports of some kind on assigned work. On the other hand, stipulated reading in connection with courses is almost never insisted on. Lists of authorities and references are assigned, but the responsibility for consulting these is thrown upon the student. Only three replies indicated an occasional exception to this rule, while but one or two stated that reports are required on such outside reading.

As already said, the work is given almost entirely in lectures, though only five replies indicated that textbooks were never used. However, it would seem that they are followed in only a few introductory courses, and that even here they are used rather as reference books. Perhaps the most usual exception is in the first course in differential equations. The replies received were unanimous in stating that there were no courses in which a textbook was used exclusively, no lectures being given.

It is customary to devote some hours or parts of hours to reports of students and discussion of lectures. However, at Harvard reports are given in seminars only, while at Princeton and Northwestern they are very infrequent. Yale, California, and Cornell do not give class

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time to discussion of lectures, though the last named appoints regular hours for individual consultation. At Wisconsin oral quizzes on lectures are a feature. The most usual practice everywhere is to allow a few minutes of each hour for discussion, questions being frequently asked in interruption of a lecture. The instructor's procedure is, as a rule, quite informal. In some cases an hour is reserved once a week or twice a month for discussion and reports.

In addition to the regular lecture and seminar courses, some institutions maintain courses for reading and research, in which the student (usually there is but one) meets the instructor at intervals for report and consultation, but no stated lectures are given. Often, but not always, this is done in connection with the writing of a thesis. Harvard announced eight such courses last year, Cornell two, Michigan two, and Missouri one. In the last two cases only were written examinations given, but in all but two courses problems were assigned for report.

Work in absentia has decreased almost to the vanishing point, Chicago alone conducting a few graduate courses by correspondence.

A number of the larger institutions are well supplied with models, calculating machines, and other mathematical apparatus, but others are more meagerly equipped. In several cases the making of models has had a place in graduate instruction.

A special feature at Yale has been the writing up of lecture notes by students and placing them for reference in the seminar room. This practice has been followed elsewhere for certain courses, but does not seem to be the rule in any other institution.

In the main it would appear that little change in methods is contemplated, certainly no general movement is on foot. Two or three institutions have inaugurated considerable departures from past usage, but this is in each case an individual matter due to changes in the personnel of the department.

6. *Requirements for the master's degree.*—The master's degree "in course" is given by practically all American colleges and universities as representing one full year of graduate study.[1] The title of master of arts or of science is also given as an honorary distinction under entirely different conditions, but we will here consider only the degree "in course." This is sought especially by students who either have but one year to devote to advanced work or are not sure of being able to continue for the doctorate, since its possession is often a decided advantage in obtaining a teaching position. Even in secondary work the master's degree is frequently insisted on, and this tendency is so marked that in the opinion of many it will before long be as much

[1] Johns Hopkins University seems to be alone in requiring two years. Bryn Mawr gives the degree to no students who have done their undergraduate work elsewhere, except as an accompaniment to the doctor's degree.

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in demand there as the doctor's degree now is for the candidate for a college position.

Excluding varieties of nomenclature corresponding to technical or professional courses, four master's degrees are given, namely, master of arts, master of science, master of philosophy, and master of letters; but of the last two the former is conferred by but 3 institutions of the 24 previously referred to, and the latter by only 1. Nearly half give the master's degree in arts only. The distinction is, except in a few instances, an artificial one in that it does not indicate the candidate's field of advanced work, but merely shows which bachelor's degree he has received. It is noteworthy that in 11 institutions of the 24 this distinction has been abandoned, and even where the degree in science is preserved it is often possible for any who prefer it to receive the arts degree, provided their work is not mainly professional or technical.

As noted on page 25, about 60 master's degrees were conferred on students specializing in mathematics in the year 1908–9, a number but little less than one-fourth the total graduate enrollment in that subject. Of the 24 institutions especially considered, only 5 or 6 failed to confer the degree in that year. Two institutions, Harvard and Columbia, gave the maximum number, 8 each.

The universal condition for admission to candidacy is the possession of a bachelor's degree from an institution of equivalent standing. Although there is some latitude in the interpretation of this rule, it is but fair to say that the student admitted with inferior preparation is usually required to make up his deficiencies, taking a longer period than the minimum of one year for obtaining the degree. Applications for candidacy accompanied by a program of studies must usually be filed early in the first semester and must be approved either by a committee of the faculty or by the dean of the graduate school. In case a thesis is required, the subject must be submitted soon after admission to candidacy. The number of courses which must be carried varies from three to five, but in the latter case an allowance is made for the thesis. Some of this work may be done in summer school, and in a number of institutions the degree may be obtained by attendance on three or four such sessions, with the usual requirements as to examination and thesis. Correspondence study or work in absentia has nearly disappeared so far as mathematics is concerned, though some catalogues still announce that part or all of the requirements may be thus met by students who have previously been in attendance. In a few cases where five three-hour courses must be carried a deduction is made for advanced work taken by the student as an undergraduate, but in excess of the requirements for the bachelor's degree. A combination with professional

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work is sometimes possible; in the case of mathematics this must be confined chiefly to teaching and engineering.

In 1904 a committee, after two years' consideration and careful inquiry, reported to the Chicago section of the American Mathematical Society on the requirements for the master's degree, with especial reference to conditions in western institutions. We will here use their recommendations, which, they state, correspond with the requirements at several leading American universities, as a basis for discussing present conditions. Their findings will, however, be only briefly summarized, since the details are easily accessible.[1]

The first questions raised are: What should be the minimum acceptable time devoted to undergraduate mathematics and how should it be distributed? The committee agrees that this should be the equivalent of five three-hour courses carried continuously throughout the four years of the undergraduate course and distributed about as follows: In preparation for the calculus (algebra, trigonometry, and analytic geometry), five year hours; calculus, including differential equations and mechanics, six hours; advanced algebra and geometry, four hours. It will be noted that this list includes seven year hours in courses classed as "introductory" in section 5. Courses in applied mathematics are not specifically recommended, though it is urged that undergraduate instruction maintain a close contact with the physical sciences. Except that four undergraduate courses are more usually taken as a minimum, and that the exact distribution here shown is not always insisted on, it may fairly be said that the stronger institutions at present comply very closely with the above conditions.

The next section of the report reads:

Upon the basis of the preparation indicated above, it is the opinion of the committee that the work leading to the master's degree should include at least 270 hours,[2] selected from the following groups of subjects. The selection should in any case include subjects from at least two of the three groups.

I. GEOMETRY.
- Projective geometry.
- Modern analytic geometry, algebraic curves and surfaces. Application of calculus to twisted curves and surfaces. (Differential geometry.)
- Solid analytic geometry.
- Descriptive geometry (Darstellende Geometrie.)

II. ANALYSIS.
- Theory of equations.
- Advanced calculus.
- Theory of functions.
- Differential equations.
- Theory of numbers.
- Invariants.

[1] Published in the Bulletin of the American Mathematical Society, 2d ser., Vol. X., No. 8 (1904), pp. 380-385.

[2] The term "hour" here refers to a single lecture hour, so that the above is equivalent to two and one-half three-hour year courses.

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III. APPLIED MATHEMATICS.

Analytic mechanics.
Mathematical astronomy.
Mathematical physics.
Mathematical theory of probability.

This arrangement provides that the candidate, in case he enters upon his graduate work with the minimum mathematical preparation indicated above, and hence having a broader general training in his undergraduate course, should be required to take at least two-thirds of his year's graduate work in pure and applied mathematics. On the other hand, as it may be assumed that the student entering upon his graduate work with a larger mathematical credit than this has had less general training in his undergraduate course, it is the opinion of the committee that he should be permitted to take as much as one-half of his work in departments other than mathematical, providing, however, that the minimum requirement in mathematics indicated above is also fulfilled.

Present practice tends to reduce somewhat the minimum here recommended, so that in a majority of the larger universities two courses in mathematics are accepted, though as a matter of fact more are usually taken. Four institutions require a candidate to present three subjects and two others require work in at least one additional department. The majority would seem to permit the student to take all his work in mathematics if he so chooses, but with one or two exceptions there seems to be no institution where this is distinctly encouraged. No general rule obtains as to the distribution of the candidate's work; this is nearly always an individual matter decided by the instructor or committee in charge. It is probable, however, that the recommendation presented above represents nearly the average of practice.

An interesting variation from ordinary requirements is presented by the University of Michigan. In addition to Plan A, which calls for the usual amount of specialization, a scheme styled Plan B allows a wider choice of studies. Here the 13 hours to be taken may be distributed as is seen fit among three departments, and other requirements would seem to be less rigid, but the year's work will not usually count as one of the two or three necessary for the doctor's degree.

It is apparently nowhere stipulated, except at Bryn Mawr, where unusual conditions obtain (see footnote, p. 32), that the candidate be able to read a foreign language. The report under consideration recommends a knowledge of German and considers French also desirable. As a matter of fact, the requirements for the bachelor's degree are such that nearly every graduate has had at least one year's work in one of these languages, but seldom enough to make reading easy. Nevertheless, in most cases some reading of foreign mathematical texts is urged, though rarely required.

The committee quoted believe that all candidates should present a thesis, but that this need not embody original research. It appears that 13 institutions of the 24 adhere strictly to this rule, while in at

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least 5 more the requirement is optional with the instructor in charge or the head of the department. In 3 or 4 others a thesis is never presented for the master's degree.

The last topic considered is that of examinations. The report mentioned recommends either a final test covering all the graduate courses taken by the student or the requirement that a high grade be obtained in term examinations in each course. The former alternative is the more usual one; in fact, it obtains at 18 of the 24 institutions considered, while in several of the others either procedure is possible. At Harvard one of the two highest of the four passing grades in each course is the sole requirement. The final examination may be either oral or written; practice seems to be fairly evenly divided in this matter, and if oral, it is usually conducted by a committee of instructors from the departments involved.

There are smaller and less reputable institutions in which the requirements are lower, and in fact some where all requirements are merely nominal. The present report has aimed only to present the state of affairs in the institutions which are really prepared to confer the degree.

REPORT OF SUBCOMMITTEE 2, ON PREPARATION FOR RESEARCH AND THE DOCTOR'S DEGREE.

The requirements for the degree of doctor of philosophy in mathematics are not exactly defined in all the institutions.[1] As a matter of fact, the policy is in force in some of them of definitely advising aspirants for the doctorate to complete their graduate studies at other universities in which graduate faculties in mathematics have long been strong and active. It is, however, clear that this condition is but temporary. The increase in the number of strong men in mathematics is resulting in added strength in an increasing number of institutions. It is, therefore, certain that the number of universities in which graduate work will be carried to a definite conclusion will be greater in the immediate future than at present.

On the other hand, in those universities in which, within the past 10 years, three or more doctorates have been awarded there is a degree of uniformity in the requirements which probably indicates and establishes a standard for the United States, the outgrowth of conditions peculiar to the educational system of this country. This standard may be described by detailing the course and career of a successful candidate in some one of these institutions.

[1] The institutions mentioned in the following pages are Brown, Bryn Mawr, California, Chicago, Cincinnati, Clark, Columbia, Cornell, Harvard, Illinois, Indiana, Johns Hopkins, Kansas, Michigan, Minnesota, Missouri, Nebraska, Northwestern Pennsylvania, Princeton, Stanford, Syracuse, Virginia, Wisconsin, and Yale. The data for Brown and California were taken from catalogues and are necessarily incomplete.

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For admission to registration as a candidate for the doctorate, successful completion of an undergraduate course terminating with a bachelor's degree is required. While all undergraduate degrees can not at the present time be regarded as equivalent in educational units, greater uniformity in the future will result from the standardizing influence in this direction of the Carnegie Foundation for the Advancement of Teaching.

In his undergraduate years the candidate has pursued courses in mathematics including the calculus, and in some instances mechanics, projective geometry, advanced calculus, and theory of functions also. In any case the courses mentioned are regarded as introductory, and are required before advanced study begins. A reading knowledge of French and German is prescribed. The course of advanced study upon which the candidate now enters extends usually over three years. This time may, however, be spent in residence at one or more universities, with the exception of the final third year. During this year the candidate must reside at the university from which he desires his academic degree. The instruction during the period mentioned is for the most part in lectures, combined with work in the seminary, prepared and delivered by the candidate and his fellow students under the critical eyes of their professors. There may be no formal examinations during this period. The responsibility of mastering his courses rests upon the candidate. In addition to mathematics, one or two minor subjects are required, usually in applied mathematics. This portion of the requirement may, in some cases, be successfully met before the final year.

The mathematical club affords an opportunity for presentation of original papers and discussions of pedagogical and pertinent questions. In the mathematical seminary library are available the standard treatises for study and consultation in connection with the lectures.

The final test of the candidate's power in original investigation is the quality of his thesis. If this is satisfactory, and if he survives the ordeal of a final examination planned to determine the extent of his mathematical attainments, he must, as a final requirement, arrange for the publication of his thesis, in whole or in part, in a manner satisfactory to the department under which he has studied.

The concluding formalities accompanying the granting of the degree are simple—a small diploma fee and attendance (voluntary but customary) at the commencement exercises.

A summary of the existing conditions at the universities named above follows, the arrangement being topical for the sake of clearness.

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1. CONDITIONS OF MATRICULATION.

The bachelor's degree accepted in matriculation is not specifically described at the following institutions, but all such degrees are considered equivalent: Cincinnati, Illinois, Indiana, Missouri, Stanford, Syracuse, Virginia, Yale.

"Graduates of this or other institutions in which the bachelor's degree is awarded for courses equivalent to those given at this institution" are accepted at Bryn Mawr, Chicago, Cornell, Kansas, Nebraska, Wisconsin.

A bachelor's degree from a college "in good standing" is required by Brown, California, Clark, Columbia, Johns Hopkins, Princeton, Pennsylvania.

Harvard University requires a bachelor's degree of "substantial character."

At Michigan the credentials of the candidates are examined by the graduate council.

It appears that at the majority of the institutions in question (16 out of 24) the mere attainment of the first degree is not deemed sufficient, but the value of the degree in educational units is decisive.

2. LANGUAGE REQUIREMENT.

All institutions prescribe a "good reading knowledge" of French and German. The practical point is that the candidate may have to consult treatises and memoirs in French, German, or Italian, and his linguistic knowledge must suffice for this purpose. In addition, Bryn Mawr specifies "some knowledge" of Latin as a requirement, and at Brown and Yale a "good knowledge" of Latin is required unless for some excellent reason the candidate is excused by the faculty.

3. TIME ELEMENT.

One year of continuous residence is required in all cases save by Bryn Mawr (two years), Chicago (one and one-half years), Columbia (two years).

Work of equal grade in other universities is generally credited for courses in the early graduate years.

It appears, as a rule, that three years of graduate study are necessary for securing the doctorate.

4. PRESCRIBED COURSES—NUMBER OF COURSES.

Rigidly prescribed graduate courses in mathematics do not, as a rule, exist. Specific exceptions are the following:

Courses totaling 20 hours for one year at Clark University. The titles of the courses are analytic geometry of higher plane curves, skew curves and surfaces, differential equations and calculus of

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variations, real and complex function theory (including elliptic functions), theory of numbers, modern synthetic geometry, theory of substitutions, invariants, finite differences.

Undergraduate courses amounting to 8 hours for a year at Yale University. The subjects are projective geometry, advanced calculus, mechanics, function theory.

The courses just mentioned are doubtless required at all institutions in which degrees have been awarded, without specific mention of this fact.

The amount of work required is also not generally defined. There are some exceptions. At Yale a candidate must have successfully followed graduate courses amounting to 18 hours for a year. At Columbia a minimum of 15 hours is required; at Virginia, 9 hours of lectures each year; at Pennsylvania, 24 year hours.

The essential point is, of course, that the candidate must prepare himself for the final examination. To make a comparison of the exacting nature of this work in various institutions is difficult and perhaps impossible. The same course (in name) might well be quite vigorously conducted at one university, and at another partake of an easy character. On the other hand, the breadth of study required can easily be determined by taking into consideration minor subjects (see the next section).

5. MINORS.

The requirement as to minor subjects at Harvard University is quite definite. From the following four divisions of mathematics, (1) geometry, (2) arithmetic and algebra, (3) the differential and integral calculus and the theory of functions, (4) mechanics and mathematical physics, the candidate must designate one as his chosen field, his major. In each of two of the other three he must present a thesis on a topic assigned to him. "These minor theses are intended to test the capacity of the candidate to prepare, at short notice, brief expositions of subjects with which he has had previously little or no acquaintance. While no strictly original work is expected on these theses, the form of presentation must be original."

Minor subjects (one or two) are as a rule required, but not specified. Princeton offers an exception in specifying philosophy and a cognate subject. At Wisconsin one minor must be studied for two years, a second minor for one year.

At Yale the requirement of 18 year hours of graduate courses results in general in the pursuance of courses distributed among three of the main divisions in the Harvard scheme.

Mathematical physics is very generally recommended as a minor.

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6. FINAL EXAMINATION.

Examinations in the courses are held by Columbia, Harvard, Illinois, Kansas, Missouri, Northwestern, Pennsylvania, Syracuse, Virginia, Wisconsin, Yale.

A formal, final, oral examination is required after acceptance of the thesis at the following universities: Chicago, Clark, Columbia, Harvard, Minnesota, Nebraska, Northwestern, Princeton, Wisconsin.

The final examination may be both oral and written at these institutions: Bryn Mawr, California, Cincinnati, Cornell, Illinois, Johns Hopkins, Kansas, Michigan, Missouri, Stanford, Syracuse, Wisconsin, Yale.

Yale offers an exception to the general rule of holding a final examination at the end of the candidate's course. At Yale the examination takes place at the end of the last year but one, or at the beginning of the last year. This determination of the candidate's attainments before work on the thesis is begun is intended as a check.

The final examination is public except at Clark, Cornell, Minnesota, Pennsylvania, and Yale.

Virginia requires no final examination; Pennsylvania, a written examination.

7. PUBLICATION OF THESIS.

Publication of the thesis, in whole or in part, is a requirement at all institutions (p. 36), except at Brown, Harvard, Michigan, Minnesota.

Special conditions imposed are: One hundred and fifty copies deposited in the college library (Bryn Mawr), 25 in the college library (Northwestern), 50 in the college library (Cornell), 100 in the college library (Clark, Chicago, Cincinnati, Illinois, Nebraska, Virginia, Wisconsin).

Printing of the entire thesis is required by Bryn Mawr, Chicago, Cincinnati, Indiana, Northwestern, Pennsylvania, Princeton, Syracuse, Virginia, Wisconsin.

Acceptance by a reputable journal of the whole or part suffices at Clark, Columbia, Cornell, Johns Hopkins, Indiana, Illinois, Michigan, Missouri, Nebraska, Pennsylvania, Yale.

At Harvard doctors' dissertations have "almost invariably been published."

8. VARIOUS.

A small diploma fee is usually required. This varies from $5 to $60 (Princeton).

The master's degree is in no case a prerequisite for the doctorate, but is recommended at Chicago, Cincinnati, Columbia, Illinois, Kansas, Minnesota, Missouri.

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9. RESEARCH AND SPECIAL COURSES.

The candidate's ability for original investigation is, in general, stimulated through work in seminaries. Topics assigned to him for private research develop this faculty, and criticism and personal conference with his instructors further the same end. Seminary work consists in discussion and criticism of original papers presented by candidates. Reports on current literature are also called for—in particular, on contributions to those special lines in which students and instructors are peculiarly interested.

10. EQUIPMENT—SPECIAL FEATURES.

Collections of mathematical models are available in all institutions for study by the candidate. At Yale a special room is equipped with all necessary tools for the making by the students of simple models. With the development of graduate clubs at universities throughout the United States has come the establishment in each institution of a mathematical club. At Harvard the club is conducted entirely by the students, members of the faculty attending as guests. The organization at Yale differs from this only in the existence of faculty supervision through the secretary of the club, who is a full professor. This supervision is nominal. In general, it may be said that the mathematical club is an informal affair, professors and students meeting for extra-curriculum intercourse and for discussion of such papers and reports as may be presented by faculty and students without obligation so to do.

The library facilities are reported adequate for all lines of mathematical research, save at Indiana, Kansas, Michigan, Minnesota, and Syracuse. In addition to the resources of the university library there exists at many institutions a seminary library, in which are available current mathematical treatises and periodicals, duplicates of those stored in the main library.

The library of the American Mathematical Society is rapidly becoming for its members a most valuable possession. By exchange, files of all periodicals and proceedings are being completed, and these are made available to members wherever located, through the regular means of transportation.

11. DEGREES GRANTED.

Within the years 1900–1909 the doctorate in mathematics has been conferred upon approximately 140 candidates, the number at the various institutions being as indicated (in a few cases round numbers are given): Bryn Mawr 1, California 1, Chicago 30, Clark 9, Columbia 10, Cornell 13, Harvard 12, Illinois 1, Johns Hopkins 20, Kansas 1, Pennsylvania 8, Princeton 3, Stanford 1, Syracuse 1, Virginia 4, Wisconsin 4, Yale 21.

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12. CONDITIONS IN THE FACULTIES.

At Clark, Chicago, and Johns Hopkins certain members of the mathematical faculties give graduate instruction only. The number of hours per week of such instruction is, respectively: Clark 7, Chicago 6–8, Johns Hopkins 4–7.

In general, graduate instruction is compensated for by a reduction in undergraduate hours. The following table makes clear the policy followed in the various institutions, the first number indicating the hours per week of undergraduate, the second of graduate instruction:

Bryn Mawr	9 and 3.
Chicago	6 and 4.
Columbia	6 and 6, or 9 and 3.
Cornell	11 and 4.
Harvard	4½ and 4½ and a reading course.
Illinois	10 and 3.
Indiana	5 and 4, or 5 and 6.
Kansas	7 and 5, or 10 and 3, or 15 and 0.
Michigan	12 and 3.
Minnesota	11 and 3.
Missouri	10 and 2, or 10 and 3.
Nebraska	10 and 3, or 15 and 0.
Northwestern	6 and 6, or 10 and 3.
Pennsylvania	10 and 3.
Princeton	6 and 3, or 9 and 3.
Stanford	10 and 0.
Syracuse	6 and 6.
Virginia	12 and 2.
Wisconsin	5 and 4, or 5 and 6.
Yale	10 and 3.

REPORT OF SUBCOMMITTEE 3, ON THE PREPARATION OF COLLEGE AND UNIVERSITY INSTRUCTORS IN MATHEMATICS.

In the preparation of the following report the committee has found little or no literature dealing specifically with the training of mathematical instructors for the higher institutions of learning in the United States. The subject is, indeed, one to which little explicit attention has been paid. The committee has therefore been obliged to beat out its own path. As, moreover, the usual preparation for the teaching of mathematics is inseparably connected with the history and organization of mathematical instruction in our country, it has been found desirable to treat the subject freely and discursively.

1. *Survey of past conditions.*—To obtain first an adequate comprehension of the conditions prevailing to-day in the teaching of mathematics, it is necessary to review briefly the past. The mathematical development in the United States during the last quarter of a century has been so unexpected and sudden, and so remarkable in its propor-

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tions, that it can scarcely be termed an evolution, but merits rather to be called a revolution. Thirty years ago the contrast between the mathematical and the astronomical situation in this country was most striking. In astronomy we numbered some of the world leaders, but in mathematics there was, perhaps, not an American known abroad for investigational work. In 1876 the Johns Hopkins University was founded, and soon afterwards the English mathematician Sylvester came to this country and started a small group of investigators. Some time prior to this Benjamin Peirce had stood forth at Harvard as a unique figure, a solitary investigator in the field of mathematics. Possibly owing to his influence, there emanated from Harvard University about 1880 the policy of sending promising mathematical students abroad that they might reap the fruits of German scholarship. To a limited extent the example of Harvard was followed by other institutions. As our mathematical students returned from abroad, stamped like many another excellent product as "made in Germany," they brought with them a knowledge of the modern advance in mathematics and an appreciation of investigation. Then it was that the mathematicians of the country were wakened so as to perceive the infinitesimal development of their science in America and the boundless advance abroad. In this manner, and largely through the leadership of Johns Hopkins and Harvard Universities, there arose a small circle of investigators, fired with a determination to bring American conditions into some sort of correspondence with conditions abroad.[1]

Roughly speaking, the years 1880–1890 may be said to mark a new departure in the mathematical education of the United States. Prior to this time there had been fixity of aim and definiteness of character in the methods of instruction. The prevailing mode of instruction was the recitation system, interspersed with a few lectures. For study a textbook was used in which definite lessons were doled out daily, and upon these lessons the student was compelled to study and recite. Naturally he presented his work in the best form of which he was capable, so as to make the best impression possible on his teacher. The instructor in turn devoted his time to correcting the mistakes and deficiencies of the student. Thus from study of a definite text and correction by the teacher great stress was laid upon *form*, while little or no emphasis was put upon imagination and upon the student's initiative or power of selection. It was the teacher's province to select the food; it was the student's to digest the daily allowance.

The amount of mathematics taught at this time was extremely limited. Calculus was a junior or a senior elective, and its theory was

[1] For further information concerning the influences which made for progress, see Prof. Fiske's presidential address before the American Mathematical Society, Bulletin, vol. 11 (1904), p. 238.

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taught from the purely formal side. Spherical and practical astronomy, Salmon's Conic Sections, and at most one or two other subjects (particularly quaternions) completed the college mathematical course.

For teaching, little knowledge of mathematics was demanded beyond the subject to be taught. After graduation the ablest students were usually called upon to teach without further study, but after the establishment of Johns Hopkins University a steadily increasing tendency was noticeable to demand first a year or two of graduate study. Yet the bright student still considered it preferable to try at once his hand at teaching, looking upon this as an experience which would fit him to profit by more advanced study later. If, on the other hand, he should fail as a teacher, no time would be lost in useless study before changing his vocation.

No special preparation for teaching was then required, nor indeed was any needed; for as a student the teacher had gone already through the machinery of the recitation mill, and this produced a certain perfection and uniformity of results. The polishing of the rough and projecting edges of the raw product through the friction of daily recitation, the demand for quick and ready expression by the student when on his feet, the insistence upon clearness, accuracy, and good English in the production of work (qualities which, it should be noticed parenthetically, were necessary to the professions of the law, ministry, teaching, into which the great majority of the students of that time passed)—all this constituted in itself an admirable preparation for teaching. Whatever may have been their deficiencies in exactness, extent, and depth of knowledge, the college mathematical professors of the time were commonly adepts in teaching the textbook material, and they knew how to present it so as to make it clear to the average man's comprehension. Like produces like. In consequence the young teacher, put in without special training to "sink or swim, live or die, survive or perish" according to his ability to control and guide the boisterous elements of his classes, generally fulfilled his mission satisfactorily.

The situation can be summed up by saying that the machinery was well adapted to its end and turned out its material after the model set. On the other hand, various other qualifications of supreme importance for the teacher were too often ignored or sorely neglected; for example, initiative in study, geometric and analytic imagination, rigor, and power of generalization. It is therefore not surprising that the mathematical training of that time failed completely to produce the true scholar or the great mathematician.

2. *Present day conditions.*—The conditions to-day with respect to teaching are in part a survival of those of the past, and in part the result of the ingrafting of new ideals and methods. The earlier methods, in so far as they were not indigenous, were an inheritance from

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the English tutorial system. The changes have been due to contact with the mathematicians of the continent of Europe, and in particular with German mathematicians. As our students returned from study abroad and themselves became teachers, there sprang up a demand for up-to-date knowledge, for *thorough* scholarship and investigation. As a test and a certificate of some ability to meet these demands, the Ph. D. degree speedily became a very common prerequisite for desirable college appointments. So rapid has been the change in recent years, and so great the growth of the more prominent institutions of the country (especially the State institutions), that the supply of teachers and investigators has become inadequate and falls ever increasingly short of the demand.

While this condition exists in the more important institutions, the average small college west of the Alleghanies has been little touched by the awakening. Institutions of respectable standing with 800 or 1,000 students also exist which are substantially in the condition of the college of 25 years ago, and this, too, without reaching the degree of efficiency and excellence attained in the old-time eastern college. Between the two extremes lie a multitude of colleges in which the new influences are felt in varying degree.

In the better institutions the mathematical progress has been attended by a remodeling of the curriculum. Calculus has become to-day primarily a sophomore study.[1] In the last two years of the college course a considerable variety of electives has been introduced, extending as far as elementary courses in the theory of functions of the real and the complex variable. Graduate courses cover a range of topics fully as wide as in Germany, and perhaps even wider.

Speaking roughly, it may be said that the mode of teaching remains the same as of old up to the calculus. Here freer and more varied methods begin to prevail. While in most institutions it is still found advantageous to teach calculus by the recitation method, yet a large part of the class hour is frequently spent by the teacher in discussion and explanation. The general view seems to be that about this time the student reaches a greater maturity of power, and the instruction he should receive requires therefore greater inspirational power and breadth of view on the part of the teacher. From this point on the recitation recedes into the background, being superseded by the lecture or lecture-and-quiz method. The subject matter thereafter is no longer closely prescribed by precedent, and the course of instruction is laid out largely in accordance with the taste, training, and ideas of the teacher.

Not only is the calculus a boundary line between two styles of teaching, but it also marks a sharp change in the problem confront-

[1] At Harvard it was so recognized as early as 1870. This is indicative of certain tendencies toward the elevation of mathematical instruction in America before the advent of foreign influence.

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ing the teacher of mathematics, a change almost as great and important as that from the gymnasium to the university in the German educational system. The alteration in the educational problem at the end of the sophomore year is so well known and recognized that it has been proposed by some to relegate eventually the work of the first two years of the college course to the high school; by others, to separate the work of these two years into a junior college leading to an appropriate degree.

Without discussing the advantages and disadvantages of either change, we shall proceed to consider further the nature of the mathematical problem in our large colleges and universities before and after the calculus. It should be borne in mind that nothing can be said that will fit all of our universities and colleges, for their number is legion. Yet in the main the remarks below portray the situation correctly, for even in the academic department of Harvard University, where the lecture system is introduced from the beginning, it is accompanied by daily tests or problems in the elementary work.

In most of the leading institutions the mathematics of the freshman year has been made either elective or semi-elective in the college of liberal arts. Such, however, is its importance that classes in the elementary subjects of trigonometry, algebra, and analytic geometry are very large and create a peculiar problem of administration. In the engineering schools the same condition holds for the calculus also. A sample illustration may be taken from the University of Wisconsin. Here in the years 1908–9 and 1909–10 there were each semester in the College of Letters and Science a total of from 300 to 330 students to be given instruction in freshman mathematics. For this purpose they were divided into a dozen or more sections. This situation necessitates a large amount of work of a somewhat routine character. In the engineering school, in which mathematics is required, practically the same condition prevails. The adoption of the lecture system for these lower classes seems unwise because of its failure to meet the individual difficulties of the student and to give him the repetition and drill necessary at that stage of his development.

Even in these more elementary classes where the recitation remains, one notices a change in the character of the problem confronting the teacher, especially in the eastern section of the country.[1] College youths no longer form a carefully selected intellectual body designed solely for the professions. The increasing educational development of the country has touched all classes, even the foreign immigrant, and has increasingly brought to college young men preparing for business pursuits. The country has been so inundated by foreign immigration as to become the "melting pot" of the nations, and the high

[1] In the newer sections of the country pioneer or unsettled conditions have prevailed largely from the beginning.

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school is the crucible. The pupils in the high schools, being in vast numbers the children of men and women who have learned the English language only after arriving in this country, mix foreign idioms with the grammar of the school. The classes are often very large (40 or 50 being not uncommon in a class), so that not much attention can be given to the individual; and the best students, in particular, suffer from receiving instruction appropriate to the mass. Moreover, the examination for admission to college has disappeared almost entirely and has been replaced by certification from the school.[1] For all these reasons the average student enters a university more poorly prepared than formerly, and brings with him less of the cultural influence of the select few in earlier days. Under these conditions the freshman instructor finds it impossible to maintain in his classes the former rigorous standards of good form, and of exposition in concise, lucid English. Consequently the recitation system no longer produces as satisfactory results as formerly, although it doubtless serves its purpose better than any substitute that has been suggested.

Subsequent to the calculus the number of pupils in mathematical classes is small. There remains chiefly the student preparing to teach in high schools and colleges, with a sprinkling of others who need mathematics for physics, engineering, or its other applications. The fundamental problem in teaching is henceforth to inculcate in the prospective teacher thorough scholarship and sound standards, which were necessarily somewhat neglected in the previous mass-instruction.

3. *The present preparation for teaching and its deficiencies.*—Owing to the changes above described the recitation system no longer affords the prospective teacher the same drill in presentation and the same feeling for form that it once did. Under the lecture system which succeeds it the emphasis is put primarily upon acquisition and upon extension of knowledge. But the mere hearing of lectures leaves the student passive and does nothing to tax actively his powers of presentation unless supplemented by other aids. (See section 4.) Furthermore, if the teacher himself is deficient in style and is so absorbed in acquisition and investigation that he slights the matter of presentation, the student is likely instinctively to copy his example and to remain content with crude and half intelligible exposition of his ideas. Thus it has happened not infrequently that a bright student has found nothing in his university training to correct the deficiencies of early years or his natural tendencies, and has gone out to his career of teaching only to meet with an initial

[1] Examinations are still required of all candidates for entrance at Harvard, Yale, and Princeton. Since the preparation of the report a modification of the method of admission at Harvard University has been announced.

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disastrous failure, from which it was difficult and sometimes impossible to recover.

The introduction of the lecture method into our country has indeed been so rapid that an amalgamation of the old and new modes of teaching into a well-proportioned, coherent, and consistent educational system has been impossible. In consequence two dangers to-day beset the mathematician. On the one hand, there is extreme and unreasonable emphasis on the research side of activity at the expense of form and clearness and without due regard to values, any sort of investigation being prized even though of little or no intrinsic worth. This results in the elimination of any true interest in the actual teaching side of the profession. On the other hand, we see the teacher absorbed by personal interest in the student and by the pedagogical and administrative side of his work, to the neglect or exclusion of progress and true scholarship. Both deficiencies are found in our educational system. In a few institutions the first-mentioned evil may be found, while the latter is conspicuous in many.

It might be thought that the difference in the educational problems before and after the calculus would result in a corresponding differentiation of teachers into two classes, the emphasis being laid in the one class upon the imparting of knowledge and in the other upon its acquisition. In France, for example, a sharp difference is made in the preparation for teaching in the lycées and for teaching in the universities. For teaching in the lycées it is necessary to pass the Agrégation. This is perhaps the most searching examination to be found in any educational system of Europe. It includes, in addition to a test of mathematical attainments, an examination in powers of exposition. For the latter, reliance upon general education is not sufficient, even in a nation temperamentally predisposed to considerations of form and elegance, but in anticipation provision is made for special preparation and instruction. No such distinction has ever been made in our country, although in choosing men for professorships there is clearly an increasing tendency to distinguish, according to the nature of the work demanded, between those who are primarily educators or administrators and those who are scholars and investigators.

It continues to be the custom to train both these classes of men as teachers by setting them to teach freshmen, traveling upward by the rough and thorny road of experience.[1] Probably the drilling of large freshman classes affords the best training in teaching that can be given to the beginner. It possesses the further advantage that the younger instructors have more nearly the same interests as the

[1] The extent to which this is done is shown by the fact that out of 225 graduate students of mathematics in 24 universities, 61 were registered as assistants or instructors. In addition should be counted a certain proportion of 57 scholars and fellows.

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lower-class students than do the older professors, and in consequence these students are likely to feel less hesitation in exposing their difficulties to the instructor than to the professor of greater reputation. Also the professor is saved thereby from routine teaching, which after many years of repetition is liable to lose its freshness and to become somewhat stereotyped, monotonous, and irksome; and he is left free for other university problems demanding his riper experience. In many institutions, however, it remains the practice for the professor to retain one elementary class (a freshman section, or more often the introductory class in calculus) for the purpose of supervision and of keeping in touch with the situation in the lower classes. The contact between professor and instructor when teaching different sections of the same class often affords the instructor most valuable training and help in teaching. It seems altogether probable that with the development of our mathematical education such work of supervisory instruction will be reserved increasingly for men of fine teaching capacity but without the taste and inventiveness for investigation.

The above system of freshman and sophomore instruction is, however, not without its serious and pernicious effects. Quite commonly 15 or more hours of this work are loaded upon the instructor, in addition to which he has numberless quizzes to conduct and "blue-books" or examination papers to correct, no distinction being made in the assignment of such work between the humdrum man and the scholar of talent and promise. But in many institutions the work is brightened by the assignment of a small class in some advanced subject. In a few instances (as at Chicago and Harvard) the proportion of "desirable electives" reaches a quarter or even a half of his total quota. Yet, in general, one result of the system of lower-class instruction has unquestionably been the draining of intellectual life out of many able men by an excess of routine work which leaves them inadequate time to carry on their study and investigation.

The handling of the huge and ever-increasing mass of students also necessitates a large amount of administrative work which is not connected with any particular branch of instruction. For this work the mathematical profession, in particular, has been looked to. By actual count there are to-day some twenty professors of mathematics who are either deans or similar administrative officers in their respective institutions. Among them are men of fine ability and scholarship, whose services are thereby lost to mathematical research and progress. Even when not occupying such a position, the mathematical teacher is supposed to be competent for administrative work and is liable to receive an extra large assignment of it. But the present situation, bad as it is, is better than the past, and gives hope of further betterment in the future. Probably also the seriousness

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of the administrative problem has been responsible for another evil besides the absorption of so much of the scholastic ability of the country. It has helped to promote the pernicious view, still too largely "held by some people of whom one would expect better things, that a man can become a good college teacher by following about the same lines as the high-school teacher, learning a very little more of his subject than he has to teach, and developing important accessory qualifications, of which the one dearest to college presidents is his capacity for administrative work."

4. *Supplement to the lecture system.*—Diverse means are employed to correct the deficiencies of the lecture and recitation systems mentioned in the last section. Among the supplements to the lecture system the setting of problems, the seminar, and the quiz should be especially mentioned.

The first of these is used relatively but little. It was introduced at Harvard about 1880. Probably the bane of the American educational system as a whole, even to the present day, is the excessively great stress laid upon the acquisition and assimilation of material. Individual initiative in treating new questions is deserving of greater recognition and stimulus. Now, the aim of problem work is to encourage this. It is to be carefully distinguished from the merely illustrative example work in our lower classes and is more akin to the use of advanced problems at English universities. It prevents mere passivity on the part of the student and, if skillfully used, will stimulate the student's imagination and pass by imperceptible degrees into real original work. Its greater use and consideration in advanced mathematical instruction in our country can therefore be recommended. In exposition it is also not without very considerable value, since the student, especially when stimulated to it by his professor, may find a peculiar interest and satisfaction in formulating properly his own results. But it should be accompanied by other methods designed to develop more actively the power of presentation and to afford proper acquaintance with periodical literature and skill in its perusal.

The "quiz" is distinctly non-German in character and origin. Though native, it is somewhat akin to a species of French conference. In the quiz a review is made of the contents of a group of lectures recently given, and this is done by discussion between student and teacher, and by sharp cross-questioning on the part of the latter. Not infrequently new material is added in this manner to the lecture already given. The advantage of the quiz is not alone to the student. The teacher is enabled thereby to keep in touch with him; and from the democratic American point of view "keeping in touch" is a cardinal element of sound teaching. The indefinite spinning of lectures by the teacher, careless whether they are being

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followed by the student, is foreign to our conception of education. Much could, of course, be said for the lecture system on the principle satirized in Clough's poem "The devil take the hindmost, O;" for, undoubtedly, by sifting the students and casting out the weak the best talent can be most rapidly developed. But one of the characteristic American aims is the development of an intelligent democracy rather than an intellectual aristocracy. It is greatly to be regretted that the quiz is not more frequently used, and its development more carefully studied. In the hands of the skillful teacher a quiz, say once in every four or five lectures, can be employed to instruct and aid simultaneously the weaker and the stronger pupils. Great insistence can be laid upon accuracy, clearness, conciseness, and upon thorough comprehension and expression of ideas; and the slipshod work, due so often to a mere hearing of lectures, can thereby be checked. While the quiz may impede rapidity of progress in a given subject, the loss is more than compensated by the hearty cooperation and the mutual understanding which it secures between teacher and student and by the added interest in the work.

The seminar and proseminar (i. e., a seminar not based upon research) are German methods adopted and adapted into the American system. In the seminar the student becomes the expositor, and oral reports are given on problems connected with his investigation or on his collateral reading. In the opinion of the committee the quiz and seminar together can be made an invaluable complement to the lecture system in the training of teachers.

Another very common aid is the mathematical club. This serves as a species of clearing house or a rallying point for the department, instructors and graduate students being brought together for discussion and report. Its advantages are very similar to those of the seminar. Here, perhaps more than anywhere else, the graduate student is anxious to show at his very best and is "tried out" to see what he can do. In some universities there are maintained two clubs of this character, one for advanced undergraduates and the other for graduates.

In certain institutions definite courses of reading are mapped out, while in other institutions the same end is sought by collateral reading assigned in connection with regular lecture courses. The bulk of this reading is in French or German. The purpose is alike to encourage wide reading, to give facility in reading foreign treatises, and to make the prospective teacher familiar with the literature of his subject and an adept in selecting material from widely different sources.

The usefulness of the M. A. and Ph. D. theses as preparation for teaching should not be overlooked. A doctor's thesis alone has proved to be a totally inadequate preparation in written exposition. For this reason some sort of a thesis should also be required for an

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M. A. degree, unless some substitute is afforded, as, for example, in the additional "minor Ph. D. theses" at Harvard. The experience of editors of mathematical journals reveals on the part of the average young investigator lamentable lack of understanding as to what is clear, coherent, and readable mathematical English. Too often the editor is obliged to ask some one to assist the author by friendly criticism. Usually a remarkable improvement is noticed after the completion of three or four successive articles by the author. The responsibility for critical work of this character should not lie with the editor but with the university teachers. Nowhere can a student be taught clear exposition better than in written mathematical English, and in no department, perhaps, are the difficulties of exposition greater than in advanced mathematics. Hence in training for teaching, the use, and if possible the repeated use, of written exposition seems to the committee indispensable. The requirement of a written theme each semester in graduate courses in which no examinations are given is an expedient especially to be commended.

In many universities assistantships and fellowships are designedly used, not merely to supplement the educational force, but as an aid in the training of teachers. The assistant or fellow while continuing his graduate study is asked to teach a few hours per semester; thus theory and practice are developed simultaneously. In a few institutions, notably at Chicago and Columbia, there is an affiliated university high school at which selected students may also teach. In certain rare instances a peculiar cooperative scheme has been tried by the professor, who employs an advanced graduate student as his assistant in large classes. The latter is present at all class exercises, observing the methods of the teacher and taking his place in his absence. He is called upon for aid in correcting papers and to give individual assistance to the student. Thus at all stages of the class instruction he is in conference with the professor regarding the conduct of the work. This would appear to be true practical pedagogy, well worthy of further consideration and trial.

5. *Teachers' courses and teachers' colleges.*—In recent years the pedagogic side of teaching has been recognized at the large universities and not a few colleges by the introduction of the so-called teachers' courses. In a few universities courses of this character have been separated and organized into a teachers' college, notably at Columbia University, the University of Chicago, the University of Cincinnati. In these courses hints concerning teaching are given, attention is called to the essentials of good teaching and to the common dangers and pitfalls, and the pedagogically difficult parts of secondary mathematics are discussed. To assist the man who goes into college work it is the aim at Columbia University and the University of Chicago to "give a good knowledge of the history of mathe-

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matics, of the curricula in different countries, and of the danger points which confront teachers in their early days of work." Special topics are sometimes assigned—for example, an historical study of the methods tried in the teaching of calculus.

Up to the present time the teachers' colleges have been patronized almost exclusively by elementary, secondary, and normal school teachers. They stand as a protest against the entire neglect of the pedagogical side of teaching. It is the apparent belief of these colleges that a great work can yet be done for college and university teachers, as well as for teachers in the lower grades. Not only is it said sharply that "training in the art of teaching is not even a minor requirement for a (higher) degree," but it is further urged that in mathematics above all subjects it is not enough for successful teaching that a man shall know the subject he teaches; he must have power of adapting it to the average man's comprehension. For this reason greater attention to pedagogy and to form is desirable in preparation for teaching, doubly so in a country where no fixed traditions prevail, and where the recent mathematical growth has been so rapid. Only in this way, it is asserted, can we save our schools and elementary college classes from the crude mistakes of the youthful teacher.

As yet, however, the influence of the teachers' colleges upon the preparation of college and university teachers has been indirect or felt purely as a protest. Special methods for the training of such teachers have not been there developed, and little, if anything, has been attempted in the way of actual courses for them. The whole question as to whether such courses should be given at all, and if so, what kind of courses should be given and where—whether in such colleges or in the graduate school—remains for determination. The whole field is a virgin one, and not to be developed hastily or inconsiderately. And, finally, it seems to be conceded that *dogmatic* instruction in the art and method of teaching would be injurious and disastrous in collegiate mathematics.

Little or no encroachment has in fact been made upon the graduate school by the professional educator. Against his view is urged the argument that there is every difference in the manner of preparing the elementary and the advanced teacher. In the elementary school the child moves in a world so different from the world of his teacher that a study of psychology and pedagogy helps to bridge the gap, but the student of 18 to 20 is sufficiently near his teacher in maturity that such aids can be dispensed with. The deficiencies of the American college teacher are rather on the side of an accurate, clear-cut knowledge; of a failure to distinguish between the husk and the kernel, and to insist without ceasing that the student shall search for the kernel. The prevalent opinion is that definite instruction in method, which

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was the old-style pedagogy, crushes individuality, produces regrettable uniformity, stifles life and capacity for growth. Better an ultimate success obtained after partial failure and experiment and without suppression of individuality, than a dead-level success, which never rises above rule and precept. Hence in the graduate school the primary aim must ever be to build a sound mathematical foundation and to stimulate a discriminating interest and enthusiasm. The chief preparation is then to teach the student mathematics.

But after all this has been justly said, there remains with the committee the belief that the graduate instruction is arranged too exclusively with reference to research and with too little reference to the needs of the prospective teacher. A limited part of the time in the mathematical club and seminary might be devoted with profit to the more strictly professional side of the training and to a discussion of the broad and changing problems of mathematical education.

Furthermore, the tendency to undue specialization in some obscure corner of mathematics, with accompanying neglect of a broad mathematical interest and outlook, should somehow be counteracted. This might perhaps be done in part by carefully planned survey courses, such for instance as Klein's masterly lectures on projective geometry or "Höhere Geometrie." In particular these survey courses could be employed to bring to the student's attention such literature and lines of study as bear directly or indirectly upon the college subjects which he is most likely to teach. And above all, the need is for broad yet incisive introductory courses in the main and vital fields of mathematics.

6. *The amount of graduate study.*—Broadly speaking, the minimum requirement for teaching in college and university tends to become the equivalent of the master's degree. But in the better institutions it is recognized that a year or a year and a half of graduate training is by no means enough for a permanent college or university position, and the possession of the Ph. D. degree is therefore made a sine qua non. The situation thus created is in many ways unsatisfactory in regard to both degrees.

On the one hand, the demand for graduates with the doctor's degree has had increasingly the effect of making the Ph. D. degree a sort of college teacher's certificate, and has acted in a generous measure to cheapen the degree. Too many doctors have doubtless been turned out who have no actual interest in research and seek the degree solely for its commercial value. It has been the rule rather than the exception that the holder of the Ph. D. degree fails to go on to further research.

On the other hand, the situation with respect to the master's degree is even worse. It is in no way an adequate certification for college teaching. In many institutions it has been regarded as

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essentially a degree for secondary teachers. In other institutions it is used with one class of students as a stepping-stone to a higher degree, with another class of students who are found not to possess the inventiveness and fertility of mind necessary for research it is both a recognition and discharge. It is indeed difficult to say for just what the M. A. degree does stand. The committee submits as a question worthy of consideration whether the M. A. degree might not be so administered or developed as to become a desirable teacher's degree in distinction from the Ph. D. degree as a certificate of research. Thus it could be used as a recognition alike for college teachers without the doctor's degree and for secondary teachers of decidedly superior capacity. Possibly in this way the Ph. D. degree could be relieved of some of the heavy load which it is now compelled to carry.

The present sharp differentiation of college mathematicians into two classes, the holders of the master's and of the doctor's degrees, is in many ways a most unfortunate one. Many men have stopped with the former who are capable of proceeding much further. The committee wishes to record its emphatic belief that every man should be encouraged to study just so far as his ability and taste may qualify him, without stopping at the line of either degree. Many a teacher without the kind of ability necessary for research can yet be encouraged to become a thorough scholar in some definite line, instead of looking to administrative office as his career.

More systematic encouragement for study after the attainment of the doctor's degree is also a desideratum. The introduction of the German Privatdocent system into this country is recognized to be impossible and totally foreign to the American spirit of financial independence after graduation. Yet some means should certainly be devised for recognizing better the more talented few and giving them opportunities for study commensurate with their ability. As before pointed out, the life and ambition of many young instructors have unquestionably been stifled by the load of 15 or more hours of classroom work, with the accompanying written exercises for correction. In the case of the ablest young instructors some financial provision for maintenance should be made with a reduced number of hours of work. The prevalent American practice is to relieve the instructor of his heavy hours of work only when he is about 40 years of age, or after he has proved himself a pronounced success by virtue of his ability or attainment. In opposition to this it can not be too much emphasized that the age of preparation for intellectual work of high order is from 20 to 30, or to 35 at the latest.

7. *The supply and appointment of teachers.*—The same general considerations which affect the supply and quality of teachers in other departments apply also to the teachers of mathematics. The serious feature in the situation to-day is a still increasing deficiency

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in supply relatively to the demand. This necessitates also to a considerable degree a deficiency of quality, since places must be filled by such persons as can be obtained. The inadequacy of the supply is primarily a result of the enormous growth of the educational system of the country, but the deficiency in quality is due also to the rapid advance of the mathematical profession in standard and knowledge. On the absolute scale the number of good mathematical teachers in the United States has never been greater, yet never also has the shortage been greater. The expansion of the country and its increase in population has outstripped growth in education, and the outlook is that the situation will become even more acute in the immediate future. Not only must the prospective growth of the country, especially of the Middle and Far West, be taken into account, but also the awakening and development of our neighbors, China and South America. This expansion at home and abroad affords a great opportunity for the engineer. It attracts and doubtless will continue to attract a large number of the ablest mathematical students away from the teaching of abstract mathematics into the practice of the engineering and allied professions.

The attractions of these professions in themselves are enhanced by the remuneration. The financial rewards for the successful engineer are incomparably greater than those for the mathematician. Twenty-five years ago the standard salary for the full mathematical professor in our best colleges was $2,500, the variation to either side of this figure being, with few exceptions, slight. To-day the corresponding figure is $3,000, the variation ranging from $2,500 in small cities to $4,000 or $5,000 for a university situated in a large metropolis. For assistant professors $1,500 to $2,500 is the current compensation. For the successful engineer the compensation must be reckoned in five-place figures.

These salaries may very possibly appear adequate to the foreign professor not acquainted with American life and social conditions, but they are notoriously inadequate to the legitimate demands of life in this country. The high price of rents and cost of living, the cost of travel necessary in a country of large distances to attend conventions and to keep in touch with mathematicians at home and abroad, and many expenditures due to prevailing social conditions are recognized to press hard upon a college professor. If he has a family of three or four children, the financial pinch is likely to be felt daily and bitterly, and anxious thought must be spent upon the mode of spending one's income. Furthermore, the mathematician, by the very nature of his subject, is cut off from the usual modes of supplementing a professor's salary open to his colleagues, as for example by writing or by the delivery of public lectures, by legal and expert advice, by chemical or biological analysis, and so on. His only resource may be to write a textbook on one or more of the four ele-

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mentary subjects in which there are large college classes. Hence we see issued year after year a large number of such books, the majority of which resemble one another like peas in a pod, and contribute little or nothing to mathematical progress. Rarely does the mathematician have both time and knowledge to write—for such fame and glory as there may be in it—the unremunerative advanced mathematical textbook or treatise so much needed in the English language.

With the obvious financial consideration there acts also another powerful force pulling men away from mathematical teaching. It is felt that the engineering professions give a chance to do "something worth while." In our rapidly developing material civilization the shallow view often prevails that the man of action stands on a higher plane than the man of ideas. The latter too is invaluable for highest development.

This sidetracking of genuine mathematical talent to engineering work is most seriously felt in applied rather than in pure mathematics. Precisely here, where the American mind might be expected to scintillate with flashes of genius, there is a real poverty of talent. While we boast our late lamented Gibbs—born like many a precious flower to blush unseen—it must be confessed that his career is indicative rather of the interest and talent which might exist in applied mathematics than of that which does exist. In support of this statement it suffices to point out how few university centers there are in the United States where a first-class training in applied mathematics can be obtained. The diversion of students to engineering is not solely responsible for this. It is in part a consequence of past influences when mathematics was pursued in our country as a branch of logic and a purely deductive science. A tendency to the purely formal side of mathematics may be noted from the days of Benjamin Peirce on. It is therefore not much to be wondered at (though much to be regretted) that American mathematical research has inclined too much to this formal side; for example, to multiple algebras, postulational and axiomatic foundations, theory of groups. Hence, there is need of great insistence to-day that applied mathematics shall be more abundantly pursued and for a longer period, and that men of sound mathematical training shall be brought into touch with vital physical problems.

The current method of filling vacant positions is the Socratic one of question and answer. The professor in charge of the department or some one of its divisions first makes necessary inquiries, writing particularly to the mathematical centers where the graduate students are most likely to congregate. When practicable, he supplements the information by personally meeting the candidate under most favorable consideration and thus gains first-hand impressions. If the position to be filled is a major and not a minor one, the candidate is

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frequently invited to come to the university for a visit, to inspect and to be inspected. The considerations governing a choice of candidates are discussed with the president, or the president and dean, and usually the choice of the professor is accepted as a result of the conference. In some cases the selection must be approved by an academic council consisting of some or all of the full professors. Under normal circumstances the subsequent ratification by the board of regents or trustees is a matter of form, since the selection of instructors is properly deemed a prerogative of the president and board of instruction.

When the head of a department is to be chosen, a common practice is to appoint a committee of from three to five members, inclusive of the president or dean, and containing representatives of other departments than the one concerned. This committee then seeks for information in all possible ways.

Applications for a vacant position are often forwarded by those who would be glad to secure the appointment. To a large extent these applications are waste paper. Wider publication of vacancies has been advocated by some, but it is the almost universal experience of those who have the appointments to make that a too-wide advertisement results in a bothersome and useless hoard of applications from men, the number of whose submitted testimonials varies inversely as the square of their fitness. Information privately solicited is trusted more than the public testimonial. In the case of well-known men a hint of their availability is as effective as any formal application, but in the case of minor appointments information supplied by a really worthy applicant is sometimes a most important factor in the decision for his appointment.

To fill vacancies in small or less important colleges the teachers' agencies are often consulted, as well as by many normal and secondary schools. In such cases the standing of the college and the salary are not sufficient to attract the better trained men secured by the methods just described. These institutions rely particularly upon their recent and brightest graduates to fill the vacancies. To a great extent the practice of "inbreeding" by selection from the alumni of the institution has been current in our country, and this has been true even of some of the largest and most important of our institutions. When carried to excess the practice cramps and narrows the development of the college or university. It is increasingly felt that the best results are obtained by a generous infusion of instructors having other ideas and training than those characteristic of the institution itself.

It can not be said that mathematical proficiency always dictates the appointments. Not infrequently there are better men available. Yet this is no doubt less often the case than is realized by outsiders, since frequently appointments which are severely criticised have been

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made only after better men have been sounded and have declined to be considered for the position. Other qualifications than mathematical proficiency must receive consideration, such as enthusiasm and the ability to stir mathematical interest in students, personality and genius to gather and keep coherent a group of promising instructors, ability to develop a department so as to make it useful and respected in the institution, and so on. Qualities such as these will doubtless weigh more in the future than in the past, while administrative ability will be less considered, owing to the increasing separation of business work. Doubtless in the past many sins of bad mathematical appointments can be laid to considerations of administrative ability.

Two qualities may be noticed as especially needed by the American teacher. The first is a broad, liberal culture. The pursuit of mathematics in itself is doubtless a narrowing one. There is perhaps no other science of which the development has been carried so far, which requires greater concentration and will power, and which by the abstract height of the qualities required tends more to separate one from daily life. A wide liberal culture therefore is eminently desirable for the establishment of that attractive personality so necessary for the best success in teaching.

The second quality, moral fiber and force, is demanded largely in all institutions, but especially in the small American college, where teacher and student come into particularly close personal relations. No just report concerning the selection and distribution of mathematical teachers can be given without some reference to this need. The denominational origin of most of the Eastern and older colleges accounts for the emphasis laid upon the possession of these qualities. While denominational lines have broken down and tend to disappear, and accordingly religious distinctions have been forced increasingly into the background in college and university education, the moral ideal nevertheless survives, receiving perhaps a greater consideration than in any other country except England. In the junior college—to designate thus the first two years of the college course—the student is still young and immature and in a formative period. Here the public claims that the student has as much a right to the care, time, and thought of the teacher as has investigation. It insists, even in the large State universities, that the youth shall be cheated neither out of its intellectual nor out of its moral birthright. The mathematical teacher with rare exceptions must begin his career either in the small college or in the junior college of the large university. He consequently must have the problems of the junior college at heart, and not neglect his students for his own investigation. Not a few talented men fail altogether because of such neglect or lack of interest, and thereby close their mathematical career.

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In the graduate school the considerations of the last section fall mostly into abeyance since the student is now sufficiently mature to criticise rather than copy the deficiencies of his instructor. Intellectual leadership and vitality are here the crucial question. With increasing separation between the junior and senior colleges there comes an increasing difference in the kinds of teachers required.

The question "From what class of society are our mathematical teachers drawn?" is a complicated one, not to be answered by statistics. Have they come up through poverty and hardship, liking mathematics for its difficulties? Do they come from the great middle classes, or from well-to-do, cultured homes? Undoubtedly all classes contribute, but the chief source is probably the second, especially that section of the middle classes which is more poor than rich and the section which lies close to the cultured classes. To men from these homes the teacher's profession offers improved social conditions and increased opportunity. Its financial deprivations are borne with sufficient philosophy and complaisance, for the love of intellectual pursuits is the life of the teacher.

The large number of mathematical teachers coming from the very small college, where the curriculum is cramped and where mathematics is one of its chief components, should be especially noted. Probably these colleges furnish an abnormally large percentage of the mathematical students for the graduate school.

8. *Concluding remarks.*—The committee abstains from prophecy or the formulation of any definite and ideal program for the training of the advanced mathematical teacher. The situation regarding such training is still chaotic, and there is no method yet apparent of evolving order. The aim of this report has been rather to point out the causes, results, and deficiencies of the present method of training (or lack of method), and it will be enough if the committee shall have succeeded in arousing interest and stimulating thought upon the subject.

Certain general points may, however, be noted by way of summary or emphasis.

The introductory course in calculus, as already indicated, forms the beginning of the specialist's training to-day. Prior to the calculus the study of mathematics is pursued chiefly for its practical and disciplinary value, while thereafter it is pursued by the mathematician for its own sake.

The instruction of the mathematician and physicist for a longer time together in identical courses would undoubtedly have its advantages. Certainly the greater intermingling of pure and applied mathematics is desirable. The extent to which they have been separated is astonishing. The pure mathematician is prone to be either helpless or ignorant before the applications, while the applied

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mathematician has rarely a good grip on modern mathematical principles. Not in a divorce from related subjects, but rather from the inspiration of contact with them, is the continued life and progress of that science to be sought which is the most perfect and coherent development of human thought.

The committee expresses the further wish that the early training of the mathematician on the purely mathematical side shall not be too narrow. The four great fields—analysis, mechanics, geometry, algebra (number fields, etc.)—should early be represented strongly in their main essentials and characteristics.

The matter of training in clear, coherent, and interesting presentation, both oral and written, should not be overlooked by the teacher, as is sometimes done, but he should be willing to give his time generously to their inculcation. A more abundant practice therein should be afforded the future teacher and investigator.

Probably greater cooperation between the experienced teacher and the beginner regarding the conduct of elementary college instruction is needed. This might be gained by more abundant discussion of the problems involved, by helpful suggestion, by mutual visitation of classes, and occasionally even by joint conduct of a class.

Finally, the amount of routine instruction, at least for the most promising of our younger college and university investigators, should be so regulated as to further rather than suppress their individual development. On the other hand, the man with a gift for teaching, but not for investigation, should be encouraged to obtain a broad and comprehensive knowledge of mathematics, and, obtaining this, should not be cashiered for failure to "produce" nor be spoiled as a teacher by being trimmed into a very mediocre investigator. The difference between the two kinds of gifts—the power to teach and the ability to extend the frontiers of our science—should be more clearly recognized and both should be amply rewarded. It is for a free and not a standardized development that we plead; and, above all, for greater freedom and leisure for the most able of our younger instructors, that they may achieve the best that is in them.

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INDEX.

Absentia, work in, 32, 33, 37.
Advanced instruction established, 7-10.
Agrégation, 48.
Aid to students, 25, 55.
American mathematical society, recommendations in regard to master's degree, 34.
American Nautical Almanac Office, influence on study of mathematics, 7.
Apparatus, 32, 41.
Applied mathematics, 27, 57, 60-61.
Astronomy and mathematics, 8.
Calculus, boundary between two styles of teaching, 45.
Cayley, A., lectures, 21, 30.
Chicago University, influence on graduate work, 9.
Clark University, foundation for graduate study, 9.
Clubs, mathematical, 37, 51.
Coeducation, 11, 24.
Correspondence courses, 32, 33.
Courses of instruction, 13-14, 20, 26-30.
Degrees. *See* Doctor's degree; Master's degree.
Development of graduate work in the West, 9.
Distinction between undergraduate and graduate work, 11, 14.
Doctor's degree, 7, 14, 36-41, 54; conditions of matriculation for, 38; courses, 38; fee, 37, 40; final examinations, 40; language requirements, 38; minor subjects required, 39-40; number granted, 25, 41; thesis, 40; time element, 38.
Elective system, influence on graduate work, 9-10.
Engineering, attraction for mathematicians, 57.
Equipment, 32, 41.
Establishment of advanced instruction, 7-10.
Evanston lectures, by Klein, 22, 30.
Examinations, 31, 48.
Fellowships, use, 52.
Financial aid to students, 25, 55.
Foreign lecturers, 30.
Foreign study, 8, 18-20.
German influence, 8.
Gibbs, J. W., foreign study, 8.
Gould, B. A., foreign study, 8.
Grading marks, 31.
Graduate students, 10-12, 23-26.
Graduate work, distinction from undergraduate work, 11, 14; growth, 24-25; in the past, 7-10; at the present time, 10-12; relation to graduate work in general, 24; time given to, by faculties, 30, 42.
Harvard University, higher mathematics course by Peirce, 7, 21.
Historical sketch, 21-22, 42-44.
Instructors. *See* Teachers.
International Mathematical Congress, 22.
Johns Hopkins University, influence on graduate work, 8, 21.
Klein, Felix, lectures, 22, 30.
Lecture system, 12-13, 30, 31, 48; supplement to, 50-52.
Libraries, 41.
Marking, 31.
Master's degree, 7, 14, 20, 55; number given, 25, 33; requirements for, 32-36.
Methods of instruction, 30-32.
Number of graduate students, 24.
Organization, 10, 12-15, 22-23.
Peirce, Benjamin, success as professor at Harvard, 7; influence, 21.
"Privat docent" system, 55.
Problems, assignment, 12, 31, 50.
Professors. *See* Teachers.
Programs, yearly variations, 29.
Proseminars, 51.
Pure and applied mathematics, separation, 27-29, 60-61.
Purpose of mathematical instruction, 12.
Quiz, 12, 50.
Research work, 16, 32, 36-41.
Salaries, teachers, 56.
Seminars, 51.
Subcommittee 1, report, 20-36.
Subcommittee 2, report, 36-42.
Subcommittee 3, report, 42-61.
Summer schools, 24.
Sylvester, J. J., professor at Johns Hopkins University, 9, 21; influence, 21, 30.
Teachers, 15-18; amount of graduate study required, 54-55; appointment, 57-59; appointment of graduates, 23; classes of society drawn from, 60; overburdening, 23, 49, 55, 61; pedagogic preparation, 53; practice work, 52; preparation, 42-61; qualifications, 23, 59; salaries, 56; supply, 55-60.
Teachers' colleges, 52-54.
Teachers' courses, 52-54.
Teaching, in the past, 42-44; at the present time, 44-47.
Technological schools, 10.
Textbooks, use, 12, 31.
Theses, 12, 51-52; publication, 40.
Time given by faculties to graduate work, 30, 42.
Undergraduate and graduate work, distinction between, 11, 14.
West, development of graduate work in the, 9.
Work in absentia, 32, 33, 37.

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UNDERGRADUATE WORK IN MATHEMATICS IN COLLEGES OF LIBERAL ARTS AND UNIVERSITIES

INTERNATIONAL COMMISSION ON THE TEACHING OF MATHEMATICS

THE AMERICAN REPORT

COMMITTEE No. X

WASHINGTON
GOVERNMENT PRINTING OFFICE
1911

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THE AMERICAN REPORT.

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CONTENTS.

	Page.
General report	5
Subcommittee 1. Men's colleges	7
Sources of information	7
Degrees held by teachers of mathematics	8
Variety of bachelor's degrees	9
Department of mathematics and related departments—organization	9
Relation of the department of mathematics to the faculty	10
Internal organization of the department	10
Relation of administrative officers to the department	10
Distribution of teaching	11
Department meetings	11
Separation of engineering and nonengineering students	12
Mechanics, descriptive geometry, etc	12
Method of appointment of teachers of mathematics	12
Changes in recent years	12
Changes still to be desired	13
Admission requirements in mathematics	13
Quality of preparation in mathematics	14
Undergraduate required courses in mathematics	15
Norm of collegiate requirement	16
Undergraduate elective courses in mathematics	17
Influence of other departments	17
Aims of teaching	18
Classroom methods	19
Determination of final grades	20
Independence in problem work	20
Personal conferences with students	20
Present tendencies	22
Preparation of teachers	22
Courses in pedagogy	23
Change of personnel	24
Subcommittee 2. Women's colleges	24
Introductory	24
Organization	24
Curriculum	25
Aims and methods of teaching	26
Subcommittee 3. Coeducational colleges	27

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UNDERGRADUATE WORK IN MATHEMATICS IN COLLEGES OF LIBERAL ARTS AND UNIVERSITIES.

GENERAL REPORT.

The work of this committee has been done in large part by three subcommittees, as follows:

1. On men's colleges.
2. On women's colleges.
3. On coeducational colleges.

The facts presented in these reports have been gathered from 60 or more leading colleges by the Bureau of Education through the use of a questionnaire, and have been supplemented materially from the catalogues and by special correspondence carried on by the subcommittee on colleges for men, and by a special short list of questions circulated by the subcommittee on coeducational colleges. By these means over 100 colleges were included in our survey.

To these reports the committee as a whole desire to subjoin a brief commentary.

The practical uniformity found in the amount of mathematics required for admission to the colleges shows that in this particular we have nearly attained a condition of equilibrium; the secondary-school teacher is not hampered in his work by diversity of standards. Accordingly, most schools now fit students for many colleges, and very little direct criticism from the single college reaches or affects them. Some more effective and stimulative mode of interaction, as through associations, is yet to be developed. Standardization has been our aim, and we record the fact that, temporarily at least, the mathematics of the secondary school is standardized, and the prevalent minimum is two and one-half years—one year of plane geometry, one and one-half years of algebra. Some colleges have imposed and later have withdrawn a requirement of solid geometry. We may venture an inference that the coming decade will not see any increase in the total requirement.

Upon studies required of undergraduates there is at present nearly the same unanimity, an amount much greater than a century ago, but probably less than the average of 40 years ago. Very few students are allowed to graduate without a year's mathematics

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in college, ordinarily at least solid geometry and trigonometry. To explain the requirement of analytic geometry and calculus, so frequent in small colleges prior to 1880, we need only to remember the paucity of courses that small colleges were able to offer, owing to their comparative poverty. Increasing resources have brought multiplication of elective studies, and so have permitted the lessening of the requirement in mathematics, as in other departments. Concerning mathematical studies offered as electives to undergraduates, from the nature of things uniformity is not to be expected; the predominance of two well-marked groups of subjects shows that college instructors are in substantial agreement upon the essentials for a student specializing in this department; beyond this, although it might be economically desirable, educational theory is not yet competent to draw a precise boundary between subjects of college grade and those of university grade.

One noteworthy thing is this, that branches of modern mathematics marking successive steps in the progress of this science still remain isolated as subjects of instruction, separate also from the older theories. Little blending has yet occurred or confluence of these tributaries into a homogeneous stream. Only within a decade is there found any indication of purposeful progress toward the combination and consolidation of accidentally severed lines of mathematical thinking. Probably not until Descartes, Newton, Lobacevsky, Galois, and Hamilton become dim names in the mists of antiquity will the characteristic thoughts of all pervade the whole of mathematical instruction. Yet toward such an end every college teacher of the present day might contribute his little. Habitual ways of thinking do influence habits in teaching; and the unremitting effort to recast and bring into relation the old and new in one's own ever-shifting horizon must produce, by slow integration, appreciable results in the doctrine or modes of thought that one imparts to students.

In the reports of two subcommittees some statistics are given of the number of men trained in universities and now teaching college mathematics. The very great increase in such teachers during two decades past indicates two things: A broader knowledge of the field of mathematics, and the acquisition of what has been called the research attitude, in the leading members of our profession in this country. These things make for stronger teaching, and it does not seem that they have been unduly emphasized as yet. But that we need at present to seek also intensification, to attach more importance to details, to increase where possible the content rather than the extent of our teaching, is believed by many. One evidence of this is the large output in recent years of mediocre textbooks. A deeper study of one's particular subject, with attention to vivid-

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ness in presentation, should surely produce more radical departures from type, more extremes of specialized excellence. Further evidence is the scarcity of pedagogical papers in the programs of mathematical societies. Still, it is proper to repeat the positive conclusion, not to be obscured or belittled, that college teaching in the past 10 or 15 years has become rapidly permeated with more modern theories, has acquired the distinctive spirit of the natural sciences, and has tended to be conducted more and more in the research manner.

Finally, two other inferences may be gathered from the data and the reports of our subcommittees:

First. College departments of mathematics could be improved by closer internal organization and esprit de corps, by more frequent discussion over the details of elementary courses, and by systematic study of the specific results attained in each course; in short, by organic self-criticism.

Second. The secondary schools, and colleges no less, could achieve more permanent results if they insisted upon teachers having specific training of a pedagogic kind in those subjects in which large classes are to be expected.

SUBCOMMITTEE 1. MEN'S COLLEGES.

SOURCES OF INFORMATION.

The information on which the following report is based was obtained in part from the answers to the "Questionnaire on the Teaching of Mathematics in Universities, Colleges, and Technological Schools or Departments" sent out by the United States Commissioner of Education, Dr. Elmer Ellsworth Brown, and in part from the catalogues of the men's colleges considered. While replies to the questionnaire came from only 17 men's colleges, that number included institutions of so varied character as to make the list a fairly representative one. Catalogues were requested from 98 institutions; and the catalogues of 76 men's colleges and universities were received. These were carefully consulted for such appropriate data as they contained. Of these 76 institutions, all are of collegiate or university grade, to the extent of offering a 3 or 4 years' course of residential study leading to the degree of A. B., S. B., Litt. B., Ph. B., or other degree of similar rank which the institution confers, all admit men only to the undergraduate courses, and all are located in the United States. The list includes all of the larger and better-known men's colleges, but fails to comprise many of the smaller sectarian and, particularly, Roman Catholic institutions, since in these instances the requests for catalogues or other information brought few responses.

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DEGREES HELD BY TEACHERS OF MATHEMATICS.

In an attempt to ascertain how much of graduate study had been done by the members of the mathematical staffs of these 76 institutions, as shown by the academic degrees in course held by them, it was found that 26 of the 76 institutions published in their catalogues either no degrees at all after the names of their teachers or a manifestly incomplete list. Thus, many Roman Catholic colleges, and such an institution as the United States Military Academy, had to be omitted. There were left 50 colleges and universities from the catalogues of which the following facts were obtained: The total number of teachers of mathematics with rank as high as instructor in these institutions was 192. Of these 192 men, 88 held the degree of doctor of philosophy, 69 had no higher degree than that of master, 29 had not gone further than the bachelor's degree, and 6 had no bachelor's degree but an engineering degree instead. Remembering, then, that the degree mentioned is in each instance the highest degree in course held by the man concerned, it was found that, of these 50 institutions, mathematics teachers with the doctor's degree were listed in 29 (58 per cent); with the master's degree in 40 (80 per cent); with a bachelor's degree in 21 (42 per cent); and with an engineering degree in 4 (8 per cent). Of these same 50 institutions, 29 (58 per cent), as above stated, had at least 1 mathematics teacher with a doctor's degree; 18 (36 per cent) had no teacher of mathematics with degree higher than the master's; and 3 (6 per cent) had no such teacher with degree higher than B. A. or B. S. Naturally the larger institutions, and particularly those offering graduate courses, have the larger proportion of teachers with high academic degrees. Thus Princeton has 13 men in its mathematical staff who have the doctor's degree, Yale (with the Sheffield Scientific School) has 11, Columbia 9, the University of Pennsylvania 8, Harvard 7, Johns Hopkins and Williams 4 each, and Brown 3. Of the 50 institutions considered, these 8 have 59 of the 88 teachers of mathematics who hold degrees as high as the doctor's.[1]

It appears to be true that the highest percentage of doctor's degrees is found among the teachers between 30 and 45 years of age. Many of the older teachers did their graduate studying in the days when the doctor's degree in course was very seldom conferred in American institutions; and many of the younger teachers have turned from their courses of graduate study to gain experience in teaching before proceeding to the point of the conferment of the coveted doctor's degree. Here and there one finds a mathematician of good standing who has chosen to scorn the prescribed course of study of which the goal is the doctoral thesis and examination, but such men are very

[1] These numbers will stand as follows for the year 1910-11: Princeton, 12; Yale, 8; Columbia, 13; the University of Pennsylvania, 10; Harvard, 10; Johns Hopkins, 4; Williams, 4; and Brown, 3.

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few in the list of the American teachers of mathematics. As an asset for the young teacher who is aspiring to a position in an American college, the doctor's degree appears to have grown in value steadily. This growth will naturally continue if the American universities continue to offer, as leading to the doctor's degree, those wisely selected courses in the higher mathematics which tend to develop best the student's interest and powers.

VARIETY OF BACHELOR'S DEGREES.

While the degree of bachelor of arts is given in course for undergraduate work by practically every college and university considered, and has the advantageous position among bachelor's degrees which years and numbers secure, many of the institutions confer the degree of bachelor of science, and some—comparatively few—give in the same way the degrees of bachelor of letters and bachelor of philosophy. Mathematics is one of the subjects offered as contributing to the qualification for all of these bachelor's degrees and is required in almost every instance, at least to the extent of the usual freshman course, as a part of the work leading to the degrees.

DEPARTMENT OF MATHEMATICS AND RELATED DEPARTMENTS—ORGANIZATION.

In most institutions the department of mathematics is a separate department, and sometimes appears as two separate departments, mathematics and applied mathematics. The department with which it is combined, when combination occurs, as in the case of some small colleges, is most frequently either that of astronomy or that of physics. While the staff of instructors in mathematics makes up the department of mathematics, the members of the various departments constitute a faculty which has general control of those departments; this faculty is the only faculty in the institution in the case of most of the smaller colleges and is one of several in the universities and larger colleges, the faculties there being known as the faculty of arts and sciences, the faculty of engineering, etc. In every faculty giving undergraduate instruction there appears a department of mathematics of some form or other; and where the departments are rated as of varying prominence and of different grades, that of mathematics is regularly found among those of the largest prominence or highest grade; it is seldom, if ever, rated as of secondary importance as compared with the departments of other subjects of undergraduate study. In several instances it stands first in the catalogue arrangement of departments and in published lists of subjects in which instruction is given. It is fair to state that in the American colleges for men mathematics appears to be losing none of the importance which has been accorded to it since colleges were first established.

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RELATION OF THE DEPARTMENT OF MATHEMATICS TO THE FACULTY.

Instances are rare where the department of mathematics is independent of the faculty, in which it has membership, to the extent of changing its policy widely or introducing important changes in the courses which it offers without submitting the proposed changes to the faculty for approval. While, however, marked departures from existing usages in the department of mathematics would seek approval in advance at the hands of the faculty, there is no evidence that the control of the department by the faculty is a dogmatic one or that it extends to matters of mere administrative detail. While the approval of the faculty is usually necessary for the offering of a new course or the extension in time or dropping of an old one, such approval is unnecessary in most colleges for the introduction of a new method of instruction in an old course or for alterations in the subject matter of a course. In a few institutions it appears that the department is wholly independent of the control of the faculty.

INTERNAL ORGANIZATION OF THE DEPARTMENT.

Where more than a single individual constitutes the staff of the department, somewhat of internal organization, either formal, or informal to the extent of being wholly undefined, exists. The senior member of the department staff is ordinarily its nominal head and takes the lead in determining the general arrangement of courses, the assignment of courses to their instructors, the method and the subject matter of the courses, the textbooks to be used, etc. In some cases the head of the department reports that he is "absolute," having full control of the department and its members; in others all teachers are "made to feel independent," while evidently subject to the authority of the head; in others "practically no serious influence or control is exercised by the senior teachers or by the head of the department over junior teachers." Probably the general usage is fairly characterized by the statement that the head of the department "may direct, but usually cooperates," or that he "controls by advice." The head of the department is, in one case at least, chosen by vote of the members of the staff of the department and is frequently not the senior member, but the unwritten rule which constitutes the senior professor the head of the department is the one most commonly followed.

The opinion and advice of the head of the department are generally sought and followed in the appointment of new instructors and assistants, as well as in the promotion of members of the staff, and this constitutes one of his chief sources of influence in his department.

RELATION OF ADMINISTRATIVE OFFICERS TO THE DEPARTMENT.

It is not customary for members of the department of mathematics to be instructed or directed at all by administrative officers in the con-

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duct of their instruction as to either subject matter or methods. The decision of all questions of this sort is regularly left to the department, and it is very unusual for any occasion to arise for the enforcement of authority on the part of the head of the department; a conference of the staff of the department ordinarily leads to harmonious agreement on any question pertaining to the department. Yet it is reported from one college that administrative officers do direct the members of the department as to both subject matter and methods.

DISTRIBUTION OF TEACHING.

In the distribution of teaching it is customary for every qualified member of the mathematical staff to have part from time to time in both the elementary and the advanced courses. The junior teachers give the larger part of the elementary instruction and the senior teachers give the larger part of the advanced instruction; but no member of the department whose training fits him for some of the more advanced courses is required to confine himself to freshman or sophomore work permanently. The reasons for this general distribution of teaching are that, for the welfare of the student, the more experienced teachers should share in the elementary work and that, for the sake of the pleasure and the progress of the junior teacher himself, some of the advanced work should fall at least occasionally to his lot. Still, some institutions report that "no principles" are followed in the distribution of instruction; in others "as a rule, senior teachers take the advanced subjects," and in still others the "rule of seniority" is "well observed," implying undoubtedly either a first choice on the part of the senior teacher or else the allotment to him of the advanced courses. Experience seems to have established that the best welfare of all concerned demands that there be frequent interchange of courses between teachers and that the junior teachers have their share of the advanced courses.

DEPARTMENT MEETINGS.

When the number of those teaching mathematics in the institution is large enough to make the holding of meetings feasible, it is customary for such meetings to be held. Sometimes these are regular and stated meetings, but more often they are informal and appointed only when circumstances seem to demand. While scientific matters are likely to be discussed on all such occasions, the conferences are usually called for the discussion of current teaching, the adoption of methods, the selection of textbooks, etc. The formal presentation of scientific papers is usually reserved for the meetings of some larger scientific organization within the college, such as the science association, where all the departments of science unite, the mathematical-physical society, where the physics teachers join the mathematics teachers, or some other similarly made-up organization.

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SEPARATION OF ENGINEERING AND NON-ENGINEERING STUDENTS.

Collegiate and technological students are ordinarily taught in the same classes in the smaller institutions. While this arrangement seems the result of a desire for economy in some instances, it is explained in one case as justified by the fact that "a class for either class of students should include both the practical and theoretical." In one of the large universities "undergraduates intending to study engineering may take their elementary mathematical courses in the mathematical department or the engineering department at pleasure, and so may students not intending to become engineers. For would-be engineering students, there is supposed to be a saving of time in taking the latter courses rather than the former, and the result is that a large proportion of them choose accordingly." In most institutions where the equipment permits the offering of separate courses for engineering and non-engineering students, the two classes are assigned to their work in mathematics accordingly.

MECHANICS, DESCRIPTIVE GEOMETRY, ETC.

Among the subjects taught by the mathematical department, mechanics and descriptive geometry are often included, to the extent of at least one course in each, while in many instances surveying and mechanical drawing also are found. In one small college the department of mathematics gives three semesters of work in descriptive geometry and a semester course in mechanical drawing; in another, the professor of surveying and mechanical drawing is not a member of the department of mathematics; and in numerous small colleges no courses at all in mechanics or descriptive geometry are given.

METHOD OF APPOINTMENT OF TEACHERS OF MATHEMATICS.

It is the well-nigh invariable usage for vacancies in the mathematical staff to be filled by the vote of the governing corporation, generally known as the board of trustees, corporation, or board of overseers. The official nomination is brought to the board by the president and comes to him in some cases on his own initiative, but more often at the suggestion of the head of the department, or sometimes by the formal ballot of the department. An appointment is seldom made without a personal conference between the candidate and the president or some member of the department or both. Ordinarily, as the college grows, the president depends more and more on the judgment of the members of the mathematical staff for the selection of new teachers of mathematics.

CHANGES IN RECENT YEARS.

Among the changes that have come during the past few years the most marked is the offering of more work in the applications of mathematics. New courses in mechanics, descriptive and projective geometry, surveying, and mechanical drawing, have been

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introduced in many colleges. To give these courses, more teachers have been needed and the mathematical staff has accordingly grown appreciably in size. Furthermore, the growth of nearly every one of the American colleges in the number of students in attendance has been marked during the past decade and has resulted in a large increase in the number of teachers of mathematics, in addition to the increase due to the offering of new courses in applied mathematics.

The reports of the United States Commissioner of Education show that the 76 men's colleges here considered had an attendance of 16,672 students in 1898 and 25,412 in 1908. This shows an increase of 52 per cent for the chosen period of 10 years. The 76 institutions contained an average of 222 students each in 1898 and 338 students each in 1908. Furthermore, only 12 of the 76 institutions show a decrease in students during that decade, and the decrease is so slight as to be disregarded in all but three or four cases.

CHANGES STILL TO BE DESIRED.

No well-defined notion of the changes still to be desired in the directions thus far discussed exists in the minds of the average mathematical staff. The majority of those formulating any ideal express it as involving still further enlargement of the teaching staff to enable more courses to be given, particularly in applied mathematics, and to make possible the giving of all mathematical instruction to divisions of small size. One professor suggests 15 men as the maximum that should ever be taught mathematics in a single division, since no larger number can receive the requisite amount of individual attention in the classroom for the securing of the best results.

The size of many of the departments of mathematics appears to warrant the holding of more frequent department meetings. The esprit de corps of the department and the productivity of its members in lines of research will both gain much advantage from the holding of regularly appointed meetings for the discussion of general mathematical questions. The help which the young instructor obtains from a presentation to his associates of the results of his own investigations is very great; and every instructor will be much surer of keeping his mathematical interests alive if he knows that an opportunity will be afforded him every month to give an account of his progress to the other members of his department. It seems desirable, therefore, that every department of mathematics which has as many as 3 members hold regular conferences for the encouragement of mathematical research.

ADMISSION REQUIREMENTS IN MATHEMATICS.

The catalogues of the 76 institutions considered show that 37 varieties of admission requirements in mathematics are made at those 76 colleges and universities. Accepting as the norm of admission requirements algebra through quadratics (including ratio and

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proportion, progressions, and the binomial theorem with positive integral exponents) and the usual textbook amount of plane geometry, it was found that only 8 of the 76 institutions hold precisely that norm for their admission requirement. Nine institutions require this norm with the omission from the algebra of ratio and proportion, progressions, and the binomial theorem; 5 institutions require the norm thus restricted in the algebra, but add the usual textbook amount of solid geometry; and 10 institutions demand the full norm with solid geometry added. The lightest admission requirement made consists of algebra to (but not including) quadratics, with no geometry; this is held by two institutions. The heaviest minimum admission requirement made consists of the norm with solid geometry, plane trigonometry, and advanced algebra (including Horner's method and determinants) added; this requirement was found in only a single instance as the lowest which the institution holds. The remaining 31 varieties of admission requirements range between the two extreme lists just given and are held in every instance by a single institution only. It is true that the differences are in many cases very slight and may sometimes amount actually to nothing more than a variety in the form of statement. That so great diversity of statement of requirements should exist seems to many instructors unfortunate, and a movement has recently made rapid progress in New England which has for its goal the securing of uniformity of definition of admission requirements in mathematics in all the New England colleges and universities, the form of definition adopted being that published (in December, 1909) by the College Entrance Examination Board.

The investigation of the admission requirements shows further that advanced algebra (algebra beyond quadratics) is made a requirement for admission in 8 institutions, a requirement for admission to the scientific course in 2, and an optional admission subject in 2. Solid geometry, similarly, is required by 32 institutions, while it is necessary for admission to the scientific course in 6 other institutions, and is an optional admission requirement in 6. Finally, plane trigonometry is required by 17 institutions, while 4 additional make it necessary for admission to the scientific course and 7 make it an optional admission subject.

QUALITY OF PREPARATION IN MATHEMATICS.

The men's colleges and universities maintain in general that the preparation in mathematics shown by their freshmen is very unsatisfactory. While an occasional individual professor feels that it is "fair" and that it "has improved within the last 10 years," the great consensus is to the effect that the students are "lamentably weak" in algebra, and are "in general but poorly prepared to do college work in mathematics." One of the more kindly criticisms

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is as follows: "The failures in the prescribed algebra are due chiefly to ignorance of the ordinary processes of algebra, and to lack of skill in dealing with ordinary algebraic expressions. In geometry, the difficulty is not that candidates can not solve hard originals, but that they can not solve easy ones, and that they do not know the book work." Again, "In algebra many students not only lack facility in algebraic transformations, but seem not to have an intelligent grasp of the principles underlying such operations." There appears to be general agreement that the student lacks "power in the manipulation of radical forms and fractional and negative exponents" and that he is not able, as he may fairly be expected to be, to solve the quadratic equation. Many are wondering whether the preparatory-school teacher, in a desire to find entertainment for the student, is not employing too much of his time in useless problems and far too little in thorough drill in the fundamental operations of algebra. Plainly, it can hardly be too much to ask of the preparatory-school graduate that he be able to solve a quadratic equation twice out of three trials; yet few can do so well as that.

No general change in the scope of the admission requirements in mathematics has taken place within 10 years. Some colleges have increased their requirement by the addition of solid geometry and few indicate as desirable in the near future any change except that solid geometry should be so added to the present requirements.

UNDERGRADUATE REQUIRED COURSES IN MATHEMATICS.

It is difficult to find any combination of subjects that can serve as a norm for the requirement in mathematics made of undergraduates in the 76 institutions or for the elective courses offered in that subject. The only case of entire agreement as to the requirement in mathematics in college is that found in the cases of two institutions that make no requirement whatever in that subject. The remaining 74 institutions announce in their catalogues 74 different requirements, different in the subjects required or, if the subjects are nominally the same, materially different as to the ground covered in them. One institution prescribes no mathematics and offers no elective work in that subject in its B. A. course. In another institution, the entire course in mathematics is of so elementary a character as to bring the student to trigonometry as the most advanced subject of senior year. A third college includes no other mathematics in its curriculum than a two-hour course for one year in plane trigonometry. If, for a measure of the time devoted to a course, year-hour be defined to mean the equivalent of an hour a week for a year, a fourth institution requires a total of 13½ year-hours of mathematics in its B. S. course and a fifth institution prescribes as a requirement of the B. A. course the following amounts of collegiate courses in mathematics: plane trigonometry, 2 year-hours, algebra 2, plane analytic geometry 3,

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calculus 5, spherical trigonometry 2, and solid analytic geometry 1, making a total of 15 year-hours. This amount comprises about one-fourth of the total requirement for the degree and is the largest requirement in mathematics found among all the institutions considered. Plane trigonometry is required more generally than any other mathematical subject; it is prescribed in the curricula or portions of the curricula of 67 institutions and the amount of time devoted to it varies in the different colleges from one-half to 3 year-hours, the various amounts of time in year-hours being ½, 1, 1¼, 1⅓, 1½, 1⅔, 2, 2½, 3. Advanced algebra is a required subject in 54 institutions, with the amount of time in year-hours devoted to it ranging thus, 1, 1¼, 1⅓, 1½, 1⅔, 2, 2¼, 2½, 3. Solid geometry is a prescribed course in 48 institutions with its amounts of time the same as those given above for plane trigonometry.

NORM OF COLLEGIATE REQUIREMENT.

The most commonly found combination of college subjects in mathematics is that of advanced algebra, solid geometry, and plane trigonometry. Exactly half of the 76 institutions prescribe this combination and the amounts of time in year-hours devoted to it are 3 (including spherical trigonometry), 3, 3⅔, 4, 4⅙, 4⅓, 5, 5½, 6, 8 (including spherical trigonometry). If a norm of college requirements in mathematics is to be selected, it must undoubtedly comprise these three subjects and these alone.

The following table shows, for the 76 institutions, the number that require the mathematical subjects indicated, in the curriculum leading to the degree of B. A. and perhaps other degrees also, or in the curriculum leading to some other degree than B. A. while not requiring them for the B. A.

Subject.	Required for B. A., etc.	Required for other degrees, but not for B. A.
	Institutions.	*Institutions.*
Plane analytic geometry	41	16
Spherical trigonometry	37	6
Calculus	19	18
Surveying	9	1
Mechanics	7	8
Solid analytic geometry	7	3
Differential equations	2	2
Navigation	1	.....
Theory of equations	1	2
Descriptive geometry	.....	3
Determinants	.....	2
Projective geometry	.....	1

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As a requirement in college, plane analytic geometry takes precedence over spherical trigonometry, while either is more commonly prescribed than calculus. These three subjects form a combination standing as a distant second to the group, advanced algebra, solid geometry, and plane trigonometry, in the frequency of its use as a college requirement. Another combination of three subjects which stand remotely next in the order of their requirement is made up of surveying, mechanics, and solid analytic geometry. There is no general recognition whatever of any other mathematical subjects as suitable ones for a requirement in undergraduate study.

UNDERGRADUATE ELECTIVE COURSES IN MATHEMATICS.

In the matter of elective courses, there is general agreement on the calculus, and elective courses in it are offered by 53 of the 76 institutions. Next in order, as subjects of elective study, stand plane analytic geometry, offered in 36 institutions (and required in others), differential equations, offered in 26, mechanics in 23, and solid analytic geometry in 22. For the rest of the elective courses, 15 institutions offer theory of equations, 14 descriptive geometry, 14 surveying, 13 determinants, 8 algebra, 8 spherical trigonometry, 8 projective geometry, 7 mechanical drawing, 5 plane trigonometry, 5 modern analytic geometry, 5 history of mathematics, 3 theory of functions, 3 quaternions, 2 modern higher algebra, 2 solid geometry, 2 vector analysis; and single institutions offer courses in many other subjects. Altogether the 76 institutions offer 123 varieties of elective courses.

INFLUENCE OF OTHER DEPARTMENTS.

While some attempt is made in most mathematical departments to adjust the work to the needs of other departments, particularly the departments of physics and astronomy, it is not frequently found necessary to alter any mathematical course in any marked way for this purpose. The elementary training which is found to be best for the student of pure mathematics is regarded by most teachers as best for the student of applied mathematics also. Some attempt is made in most courses, and particularly in the calculus, to find such problems as have immediate application in physics and astronomy, if such problems suit the mathematical needs of the case; and in this way the interests of the kindred departments are served. But, while indirectly contributing thus to the teaching of other sciences, it is the belief of most teachers of mathematics that astronomy and physics, as such, should be taught by the professors of those sciences rather than made a part of the courses in mathematics. The applications used in the mathematical courses have the emphasis placed on the mathematics of the problem rather than its physics or its astronomy;

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and an application sought too far from the field of mathematics may fail of its purpose as an illustration of mathematical principles.

Some correlation of courses in mathematics and engineering is attempted in many institutions where both are taught, but this attempt is not carried so far as materially to alter the ground covered. There is no ground for believing that the mathematical curriculum is restricted by the congestion of subject matter in the engineering courses. In a few institutions the departments of applied science prefer to give the instruction in mathematics which their students need. In the majority of cases the mathematical courses, as far as to include the calculus and differential equations, are taken by the technological students.

RECENT CHANGES.

The changes of the past 10 years have involved the substitution of the elective for the required system in mathematics in some institutions, thereby lessening the number of students in the mathematics courses; the introduction of more courses in the application of mathematics, surveying, mechanical drawing, etc.; and the acceptance of a wider range of admission subjects, with the consequent adjustment of the college courses to a greater variety of preparation in mathematics.

AIMS OF TEACHING.

The aims in the teaching of mathematics are stated by the teachers as comprising, first, the development of analytical power and logical keenness, and, secondly, the advancement in mathematical dexterity and accuracy in computation. The making of expert mathematicians is avowedly regarded as subordinate, in some of the colleges, to the development of mathematical power as a means of culture. Complaint is offered in some quarters on the ground that the average student who does not find mathematics an attractive subject obtains little advantage of any sort in the required study of it. Some teachers aim at the development of different powers in the study of different mathematical questions, laying emphasis on accuracy in computation in logarithms, on mathematical dexterity in analytical trigonometry and parts of the calculus, on analytical power in analytical geometry and mechanics, etc. It is interesting to find that many teachers of mathematics attach great importance to the cultural value of the study of their subject. One professor writes thus: "Students who go far enough in the study of mathematics and who give it their interest as well as their time gain immensely in resourcefulness, and I am inclined to believe that the gain in general culture (especially if the teaching is done somewhat with this aim) is far more than is generally supposed." One notes that the study of mathematics, with emphasis on its analytical reasoning, influences the whole habit of mind of the student and affects his entire education.

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CLASSROOM METHODS.

In one of the large universities which have reported their methods, it is found that "oral recitations and blackboard work for the student are little used. Lectures with problem work and written tests are used in most of the courses." It is perhaps because it is difficult in very large classes to apply methods of oral recitation and of much solving of problems on the blackboard in the classroom by the student, that the large institutions have so little of that work In the colleges there is ordinarily no formal giving of lectures in any of the lower courses, but much time is devoted to the quizzing of the students and to the solving of problems by the students at the blackboard. In some of the leading colleges a portion of the exercise is ordinarily devoted to a presentation of the subject of the next lesson, with much questioning of the students after such a fashion as to convince the student that he is assisting at the rediscovery of mathematical truths; in the more advanced courses this method develops into a form of lecturing, which is very informal, but suffices even in courses where no textbook is used. This encouragement of the attitude of discovery on the part of the student is one of the most hopeful signs of the present time in the mathematical world. In most of the institutions there appears to be very little use made any longer of formal reciting of rules committed to memory from the textbook; the recitation is regularly in the words of the students.

In very recent years a strong movement has made itself felt toward lessening the size of divisions in mathematics classes. In some institutions as many as 12 divisions are made of a class of 180 freshmen for their work in mathematics, with the consequent possibility of having the entire division at the blackboards at once. The enthusiasm of the teachers as to the advantages of this arrangement of very small divisions in all work in mathematics, in the institutions where it has been tried, makes one feel that it is a misfortune, if not a great mistake, to have to teach mathematics to divisions numbering more than 20. While the possibility of much informal conference between teacher and pupil is regarded as most desirable, few institutions make any use of so-called seminar methods of teaching mathematics to undergraduates; such methods are in use in the teaching of graduates. With the lessening of the requirement of the formal recital of rules from memory, there has come a more widely prevalent custom of the assignment of problems to be handed in by the student as evidence of the work done outside the classroom, and of the imposition of frequent written tests in the classroom.

PROGRAMS.

Definite programs of elementary courses are prepared in advance in somewhat more than half the institutions from which reports have come. In perhaps half of the institutions where such programs

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are prepared, duplicate copies are placed in the hands of the students; in the other institutions, such programs are for the use of teachers only. Where no programs are prepared, textbooks are regularly used as the basis of the classroom work.

DETERMINATION OF FINAL GRADES.

The tendency of recent years has been to attach more and more weight to the term work, as compared with the final examination, in determining the final grade. While some of the institutions considered attach equal weight to the term work and to the final test, none gives greater weight to the latter than to the former, and the great majority of institutions let the term work count for considerably more than half in determining the final standing. In some institutions the apportioning of weights differs greatly in the various mathematical courses according to the subject studied and the methods used. The term work regularly includes, as the basis for determining its mark, not only the oral recitations, but also the blackboard work, the problems solved outside the classroom, and the occasional tests.

INDEPENDENCE IN PROBLEM WORK.

In some institutions very great care is taken to encourage independence in the solving of problems; this is carried to the extent of assigning to each student a different set of problems for outside work and of criticising with much thoroughness and returning all written work, all this being done by the instructor in charge of the class, without the help of any assistant. The honor system is sometimes made to include the solving of problems outside the classroom, so that the student works under a pledge of honesty. Rigorous disciplinary measures are used in a few colleges to secure independent work, while in others the statement of the student as to the number of the assigned problems which he has solved is accepted without further verification than that afforded by the recitation exercise.

The work of examining the problems submitted in writing by the student falls in some instances to an assistant, sometimes himself an undergraduate, but it is still the general rule that the man in charge of the course attends to all this work. Although in nearly all the small institutions problems are assigned for daily work outside the classroom and are carefully examined by the instructor, yet some of the instructors in the larger institutions assign no problems whatever for outside work, appear to attach no importance to independence in problem work, and take no steps to secure it.

PERSONAL CONFERENCES WITH STUDENTS.

The attitude of passive consent on the part of the instructor to a personal conference, when one is sought by the student, has been

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changed of late years to a position of definitely requiring conferences, either with each student individually, or with such students as choose to come in response to a general invitation. Some teachers are regularly available in the classroom at suitable hours each week for "consultation" and find those hours in great demand on the part of their pupils; other teachers make the same attempt but meet with little response from their classes. That an instructor's time should be held so largely at the disposal of any earnest student marks somewhat of change in recent years. It is generally believed that this investment of an instructor's time and energy is a productive one. Its chief danger lies in the fact that, in the intimacy of the personal conference, a kind-hearted instructor often finds it difficult to refrain from doing the lazy student's work for him.

AMOUNT OF TEACHING.

The average number of hours of classroom instruction given by the individual teacher is 11; the largest found in the reports is 20, and the smallest regular number, in some of the larger institutions, is 9. Members of the mathematical staff are ordinarily given a generous share in administrative work and the duties of the average professor of mathematics are much increased from that source. Few, if any, other subjects are so largely represented in the administrative offices of the colleges and universities.

SIZE OF CLASSES.

The sizes of divisions in the classes in mathematics range from 60 to 20 (with 30 for the average) in the elementary courses and from 20 to 3 or 4 in the advanced courses. In general, the larger divisions are found in the larger institutions.

USE OF MODELS.

Models are used to some extent in nearly all institutions, while in a very few they are made by the students. Some professors of mathematics object to involved or intricately fashioned models, feeling that thereby the student has his attention drawn away from the mathematical point at issue. Although few institutions possessed any models at all 20 years ago, it is encouraging to discover that excellent collections of them are now found in many of the smaller colleges.

LABORATORY METHODS.

Courses in mechanical drawing are now given in many colleges and universities, and it is in these courses only that anything of the nature of laboratory work is reported as required in mathematics.

Tables of formulas are allowed to the student in the classroom in many institutions. The more simple and frequently used formulas

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only are learned, and the student is encouraged to devote his attention to becoming expert in applying the more difficult formulas in the tables without memorizing them.

PRESENT TENDENCIES.

The increase of conference methods, the elimination of mere memorizing, the attempt to make problems and illustrations more than mere puzzles, and to show the widest application of the mathematics taught—these are the lines of change of the past 10 years and of the present. Less praiseworthy changes mentioned are the use of such methods of presentation of the mathematical subjects as to secure less concentration of mind and less of patient labor than formerly—a criticism evidently intended to apply to the so-called lecture method, which, fortunately, is not in general use. A tendency to make the connection between different mathematical subjects plain and close, amounting in some instances to the teaching of higher algebra, analytical geometry, and calculus in a single course with a single textbook prepared for the purpose is one of the noteworthy movements of the present time in mathematics. Another movement of perhaps still greater promise is that which aims at the development in the student's mind of the attitude of the explorer, through teaching him to discover mathematical facts for himself, rather than to learn them from some textbook.

PREPARATION OF TEACHERS.

There is general agreement that a good undergraduate course in arts, followed by a graduate course in mathematics leading to the degree of Ph. D., provides the best preparatory study for the work of teaching mathematics. Much importance is attached to experience in teaching, with experience in college usually preferred to that of the preparatory school. Some colleges refuse to appoint an inexperienced teacher, and few institutions will fill any, save the very lowest places, with those who have never taught. Many believe that the course of graduate study should not be completed until there has been at least a year devoted to teaching, since "the successful teacher must know two things, his subject and his pupil. He should not try to learn all of the one before he begins the earnest study of the other." Although great weight is given to scholarship in the filling of most professorships, one professor writes: "I would not belittle research work, but the most of our teachers should be devoted to teaching and not to research primarily. A teacher should have broad training, an invigorating personality, and broad sympathies. I believe great devotion, save in rare instances, to research makes one narrow and selfish." Fortunately, it is generally believed that devotion to research keeps the enthusiasm of

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the teacher alive and insures a certain vitality in his instruction which is of the greatest value to his students. The teacher who years ago ceased to study is not likely to kindle in others a wholesome enthusiasm for intellectual work. A subject becomes dull when presented by a man who is not participating in its active development but only marking time. While actual engineering experience is regarded desirable, it is declared by the majority not essential; only a single professor, himself an engineer, states that it is absolutely necessary to the best training for the mathematics teacher's life. The report of the head of a department which contains no men with doctor's degrees implies that a single year of graduate study affords ample opportunity for preparation. One worthy professor maintains that the chief qualities necessary to success in the teaching of mathematics are "good sense and good citizenship." A single professor speaks of graduate study abroad as though it contained any special merit; would not many have thought a score of years ago that it must be "abroad" to be graduate study at all?

The establishment in this country, under the leadership of the Johns Hopkins University, of several excellent graduate schools is one of the most helpful movements of recent years for the work of our colleges in mathematics. Not only are the courses which these institutions offer comparable in their scope and in the ability of the men who give them with the best to be found in other lands, but the teacher of mathematics who has done his graduate work in an American institution has the great advantage of being able to maintain a close relation with his graduate teachers throughout his life. This intimate connection with a graduate school is of very great help to the teacher.

Opinion is divided regarding the wisdom of a special attempt on the part of technological schools and departments to prepare students for mathematical teaching and to encourage those technological students who show exceptional ability to specialize in mathematics. Most heads of departments feel that the course in arts affords the best preparation for the mathematics teacher; but the dearth of good candidates for the many vacancies in mathematics which occur each year offers a strong argument for the encouragement of the technological students in preparation for teaching.

COURSES IN PEDAGOGY.

There is a universal feeling that courses in the pedagogy of mathematics are of very small advantage to the future college teacher. Those professors who are willing to see such courses introduced specify either that they should be in addition to all the present courses in mathematics and not a substitute for any purely mathematical subject, or that they should be introduced only to satisfy the imperative demand of the schools.

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A wiser view seems to be that which argues that the college teacher can well afford to spend some time in learning the best methods of teaching, whatever his subject; and that a course in the pedagogy of mathematics will be of very great value to the teacher of mathematics when the graduate school or university shall have developed a course suited to his needs. There appears to be sufficient material at hand, and it is strange that no American institution has solved the problem of a course in mathematical pedagogy in such a manner as to appeal to the professor of mathematics.

CHANGE OF PERSONNEL.

The rate of change in the mathematical staff of a college or university appears not to be large. In a fairly representative list of 12 institutions which have 52 men in their departments of mathematics, only 101 different men have been in service during the past 10 years. One college which ordinarily has a staff of 3 men has had 10 different men during that period, while a large university with a staff of 11 men has had only 15 different men since 1899. The rate of change appears to be considerably larger in the institutions with low salaries than in those where the salaries are more nearly adequate to a man's need.

PERMANENCY IN POSITIONS OF LOW RANK.

The great majority of the men answering the questionnaire believe that there should be no permanent or protracted retention of teachers below the rank of assistant professor. No man should be continued in college teaching who fails to prove himself well fitted for his task. Surely a man who is well fitted should be given no less in rank or salary than the full professor now receives.

SUBCOMMITTEE 2. WOMEN'S COLLEGES.

INTRODUCTORY.

The following report is based upon replies to a set of 45 questions sent to the following colleges for women: Bryn Mawr College, Bryn Mawr, Pa.; Elmira College, Elmira, N. Y.; Goucher College, Baltimore, Md.; Radcliffe College, Cambridge, Mass.; Rockford College, Rockford, Ill.; Smith College, Northampton, Mass.; Vassar College, Poughkeepsie, N. Y.; Wellesley College, Wellesley, Mass.; Wells College, Aurora, N. Y.

ORGANIZATION.

1. *Mathematical staff.*—The number of teachers engaged in mathematical instruction in each college varies from 1 to 7. In general there is one professor in charge of the department, with associate professors, instructors, and assistants. In colleges not affiliated with

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universities the professors are women (with two exceptions), and all other instructors (with one exception) are women.

2. *Method of appointment.*—Members of the department are appointed by the trustees on the recommendation of the president, and, in some cases, of the head of the department.

3. *Restrictions on work.*—A general supervision of courses is exercised by the governing board of the college, which in some cases limits the amount of work that can be required of students, passes upon new courses proposed by the department, makes regulations as to examinations, etc.

4. *Responsibility of the head of the department.*—In most cases the professor in charge of the department is responsible to the college authorities for the conduct of the work of the entire department, but confers with the other members on questions of method, textbooks, etc.

5. *Division of work.*—The fact that a one-year course in mathematics is required in almost every college of this group necessitates a far larger proportion of students in elementary courses than in advanced courses. The elective work is generally carried by the senior teachers, though in some colleges an effort is made to divide the required and elective work evenly among all the teachers.

6. *Department meetings.*—Department meetings seem to be employed mainly for discussion of work.

7. *Changes in organization.*—Practically no changes in organization have been made lately or are now contemplated.

CURRICULUM.

1. *Requirements for admission.*—The usual requirement for admission to these colleges is two and one-half or three units, including elementary algebra through quadratics, ratio, proportion, the progressions; and plane geometry with much work in the solution of original exercises. These requirements have been practically unchanged for many years.

2. *Age at entrance.*—The age of the students at entrance is 16 to 18½ years.

3. *Defects in preparation.*—The chief defects noted are lack of independent thinking and of accuracy, and rustiness in algebra, which seems to be less satisfactorily taught in preparatory schools than geometry.

4. *College courses.*—Every college offers work in solid geometry, advanced algebra, trigonometry, analytical geometry, and calculus. Other subjects offered in all but some of the smaller colleges are projective geometry, modern geometry, curve tracing, differential equations, advanced calculus. Some also offer courses in quaternions, theory of functions, modern algebra, modern geometry, rational

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mechanics, celestial mechanics, history of mathematics; two colleges report some work in mathematical drawing.

5. *Textbooks.*—The textbooks mentioned as in use are the same that are found in similar lists prepared for men's colleges. Textbooks in mathematics for women are unknown in the United States.

6. *Applications of mathematics.*—In only a few colleges is an effort made to meet the needs of other departments dependent on mathematical preparation. There seems to be little systematic effort made to apply the principles of pure mathematics to physics, etc., though applications made in ordinary textbooks are studied. Three colleges report work in applied mathematics.

7. *Changes in curriculum.*—The standard courses have changed little; new courses are introduced as opportunity is offered.

AIMS AND METHODS OF TEACHING.

1. *Place of emphasis.*—Emphasis is laid upon independence of thought, self-reliance, accuracy, the cultivation of the reasoning powers, insight or discernment; the stage of advancement of the student and the individuality of the teacher determining which shall be foremost in any given course.

2. *Conduct of classes.*—Wide divergence of method is reported; some emphasize oral recitations and blackboard work, some lectures. The former seems to be oftenest used for immature students, the latter for advanced students, while with graduate students the seminar method is employed. Work submitted by the students, often at each appointment, is returned to them after being criticized by the instructor. The importance of independence in such work is generally strongly emphasized.

3. *Tests.*—Tests are made by frequent written work and by final written examinations, and the final record of the students' work is determined both by these tests and by the daily work.

4. *Conferences.*—Conferences with students are not arranged according to any regular system, but instructors hold office hours or arrange for interviews as needed for advice or assistance.

5. *Amount of work.*—The amount of work carried by each teacher varies in different institutions from 9 to 18 hours each week.

6. *Size of classes.*—So far as reports are given, the number of students in a single division of required work varies from 20 to 33. In advanced classes the variation is still greater, but the numbers are in general smaller.

7. *Use of models.*—Half the total number of colleges report that rough models are made by the students. Half report regular use of a collection of models in all geometrical work.

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PREPARATION OF TEACHERS.

Those colleges which replied to this question report unanimously on the requirement of graduate study. Some emphasize the necessity for successful experience in secondary schools.

In general little divergence is found between the men's colleges and the women's colleges as regards the above points, and particularly requirements for admission and general content of courses. The most marked difference is probably in short courses planned for engineering and scientific students. In the women's colleges the only reason for electing work in mathematics is a genuine interest in the subject; it is rarely studied as a means to an end.

SUBCOMMITTEE 3. COEDUCATIONAL COLLEGES.

This report on the teaching of mathematics in coeducational colleges and universities is based on an examination of the catalogues of a large number of such schools and on the replies to questions sent out to the heads of mathematical departments in institutions of various ranks. An effort has been made to secure information from institutions which are widely representative, and to this end inquiries were sent to the larger State universities, all of which are coeducational, several large institutions on independent foundations, and many smaller colleges. Two sets of questions were submitted: First, a general list intended to cover the facts of the preparation and experience of teachers, the organization of departments, the plan of the courses of study, and the methods of instruction; and second, a list designed to elicit information on the special topic of coeducation.

To the first series of questions replies were received from 32 institutions, of which 5 were State universities, while the remaining 27 included colleges and universities of all ranks and widely distributed. The information obtained may thus be said to fairly represent conditions of mathematical instruction in the class of institutions covered by this report. From the data at hand it would appear that the general conditions of mathematical instruction in coeducational colleges and universities do not differ materially from those in institutions for men alone. The staff ordinarily consists of a professor with supervisory powers and responsibilities, appointed for an indefinite period, and associated with him one or more of the same rank but with less responsibility. Next are associate and assistant professors appointed for a period of three or five years; then follow instructors on annual appointments and with little responsibility other than the immediate work of teaching. With minor variations

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this is the organization of the department staff in all American colleges. In some instances, however, the staff selects its own administrative head, but such instances are rare. Appointments are made by the governing board of the university or college on the nomination of the president after consultation with the head of the department.

Of the preparation of the teaching staff it may be noted that in the 32 institutions reporting the aggregate staff was 97, and of the whole number, 37, or slightly more than one-third, had attained the doctor's degree. The distribution of men of the best preparation is quite uneven, some being found in small colleges with few students, but the largest percentage of those with doctor's degrees, as might be expected, are in the largest and most aggressive institutions. There is wide difference of opinion among those reporting as to the importance of pedagogical training for the young instructor, the larger institutions apparently putting the emphasis on scholarly attainment and the smaller colleges in general attaching importance to teaching ability and skill in classroom manipulation. All agree, however, that a year or two of experience as teacher in a secondary school is a valuable asset in the college or university instructor, though perhaps not in the minds of all the most valuable.

The method of instruction employed varies with the topic and with the advancement of the pupil. For elementary courses classroom exercises and recitations prevail. This method is ordinarily carried through the introductory courses in analytical geometry and the calculus, but for more advanced courses the usual procedure is for the instructor to lecture on discrete topics, accompanying his lectures by quizzes and written exercises. In elementary courses the classes are usually limited in number to 25 or 30 persons, and where more than this number are taking the same subject duplicate sections are formed. The seminary method is used in most advanced courses, and especially in graduate courses.

For admission to college classes the mathematical requirement is almost uniformly a knowledge of plane geometry and of algebra so far as to include quadratic equations. This knowledge may be acquired in a secondary school in two and one-half years, one and one-half years being given to algebra and one year to geometry. A few coeducational colleges require also solid geometry for admission. After the student is admitted to the college or university there is more divergence in the requirement. About two-thirds of the institutions reporting require mathematical study of all students during their first year, the remaining one-third permit a substitution of physics, astronomy, or some other science. Of the subjects required, plane trigonometry is most common; in fact, is almost universal. With it appear solid geometry when not required for admission, a

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more advanced course in algebra, and, in a few instances, an elementary course in analytical geometry. There is no instance in a coeducational school of the calculus being required of all students.

The special inquiries on the relative attitude of men and women toward mathematical study show that in the 23 institutions reporting on this subject, there was an average of 58 per cent of men and 42 per cent of women in the courses required of all students, and in elective courses there were 62 per cent of men and 38 per cent of women. Though these percentages of required and elective courses show no marked difference, they seem to indicate that while a fair proportion of women left to their own choice will select mathematical studies in preference to others, the proportion is not so great as among men.

The selection of courses in any science is a fair index to the tastes of students. Even though it may be said that the courses are followed for utilitarian purposes, for example, for engineering on the one hand or for teaching on the other, still the native taste of the student, whether for this science or that, influences the choice of occupation. Except for a fondness for mathematical reasoning, the young man will seldom choose the profession of astronomer or engineer in preference to that of historian or linguist, and neither man nor woman chooses to teach mathematics in preference to languages except for pleasure in the subject matter itself. On this basis, then, though it may be claimed that mathematics is studied chiefly for utilitarian purposes, we find little difference between men and women in their natural inclinations toward the science.

As to ability in the pursuit of mathematics, the consensus of those reporting again seems to be that no marked difference exists, so far at least as is shown in the more elementary courses of the ordinary college curriculum. The mode of approach is sometimes different, the women being more bookish, the men more independent and original, and this condition tends to carry men further into mathematical study and to develop a difference in later and more advanced courses, but the evidence even on this point is not clear. One reporter in a State university says: "In recent years the greater number of students in advanced mathematics have been women. The women have, moreover, averaged better than the comparatively few men, but the best student in nearly every class has been a man." Another in a similar institution says, "Formerly the men were plainly stronger on the average than the women. Now in my classes the women probably three times out of four lead the men."

In response to an inquiry as to a preference by women for geometry over analysis or the contrary, the replies are practically unanimous that no such preference is shown. One person reporting states that

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"women do in some measure prefer geometry," but in the main there is an agreement of "no difference between men and women. Sex has nothing to do with it," as far as choice of subject is concerned. Men and women for the most part meet in the same classes and receive the same instruction. If for convenience or for temperamental reasons, classes are organized for the sexes separately, as is done in some colleges, the methods of instruction and the subject matter covered are identical.

It may be truly said that this investigation has developed nothing that would indicate a tangible difference between men and women in mathematical ability or taste, and the colleges are treating them alike in methods of instruction and in quality and quantity of work demanded. Still, it remains that most teachers are conscious of a certain difference in the mental attitude as shown by a woman or by a man toward a mathematical problem. What that difference is can not be easily defined, but a man's approach has in it a certain ruggedness which is lacking in the approach of a woman. The latter is sometimes more effective, and the woman will frequently surpass the man in mental acumen, but still there is a difference, and this fact leads naturally to the inquiry, now that it has been demonstrated by many years of education side by side that women can do mathematically what man can do, if there should not be in the near future some differentiation in college courses, in subject-matter or in method, which will emphasize and develop that proper sex difference which is so generally recognized.

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EXAMINATIONS IN MATHEMATICS OTHER THAN THOSE SET BY THE TEACHER FOR HIS OWN CLASSES

INTERNATIONAL COMMISSION ON THE TEACHING OF MATHEMATICS

THE AMERICAN REPORT

COMMITTEE No. VII

WASHINGTON
GOVERNMENT PRINTING OFFICE
1911

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CONTENTS.

	Page.
General report	7
Subcommittee 1. Nature of promotion in elementary schools and admission to secondary schools	10
General conclusions	12
Subcommittee 2. Entrance to college by college examinations	14
The rise of the American college entrance examinations in mathematics	14
Present conditions	16
The argument for the retention of the college entrance examinations as presented by an experienced school principal	17
Recommendations as to desirable improvements in preparing for these examinations	19
Recommendations as to improvements in setting these examination papers	21
Specimen examination	22
Subcommittee 3. Entrance to college by college entrance board examinations	28
History	28
Examination papers	29
The plan of preparing the papers	30
Method of reading and grading papers	31
Attitude of preparatory schools	32
Attitude of the colleges	32
Finances	33
Publications	33
Statistics	33
Specimen examination questions	34
Subcommittee 4. Entrance to college by State examinations	40
Specimen examination questions	43
Subcommittee 5. Entrance to college by certification	50
History	50
Results	57
Subcommittee 6. State and local examinations of teachers	60
Subcommittee 7. Examinations of actuaries	63
Syllabus of examinations	64
Specimen examination questions	67
INDEX	71

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EXAMINATIONS IN MATHEMATICS, OTHER THAN THOSE SET BY THE TEACHER FOR HIS OWN CLASSES.

GENERAL REPORT.[1]

The chairman of this committee, in submitting the reports of the several subcommittees, wishes to call attention to certain general considerations.

The proportion of school children and other students in the United States who are required to take examinations other than those set by the teacher for his own classes is exceedingly small. Except in New York State, where a considerable number of children in the elementary and secondary schools are accustomed to take examinations set by the State education department, almost the only examinations of the kind are those set by a small number of colleges and by the college entrance examination board at the point of transition from the secondary school to the college.

According to the report of the United States Bureau of Education there was in 1908 a total enrollment in educational institutions of the United States of about 19,000,000. About 1,000,000 were attending public high schools and other secondary schools, about 200,000 were attending colleges and universities (excluding professional departments and schools), and about 100,000 were attending law schools, medical schools, and other similar professional schools.

According to the report of the Commissioner of Education there were in 1908 nearly 700 so-called colleges and universities. The Carnegie Foundation for the Advancement of Teaching had placed only 67 of these on its accepted list.[2] Only 7 of the 67 required that all candidates for admission should take entrance examinations. Of the institutions not on the accepted list of the Carnegie Foundation only 4, namely, Bryn Mawr College, Haverford College, the United States Military Academy, and the United States Naval Academy, had a similar requirement. In 1908, according to the fourth annual report of the Foundation, between 4,000 and 5,000 students were enrolled in the entering classes of these 11 institutions.

[1] The exact topic assigned to the committee preparing this report was "Examinations in mathematics other than those set by the teacher for his own classes."

[2] Several are excluded because of connection with religious denominations, although of high standing educationally.

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In estimating the number of candidates examined annually for admission to college it must be remembered that a very large number spread their examinations over several years, taking, for example, an examination in algebra one year and an examination in geometry another year, etc. Then, too, the colleges that admit students on the basis of secondary school certificates frequently require candidates who can not obtain such certificates to take admission examinations. In view of these considerations, it seems probable that the total number of candidates taking admission examinations in 1908 was about 10,000. We may say, therefore, that in the year 1908, of 900,000 children attending secondary schools outside of New York State, less than 1 per cent were required to take examinations other than those set by the teacher for his own classes.

In New York State, on the other hand, examinations set by the education department were used very extensively for the purpose of testing candidates for admission to the public high schools and for promotion in and graduation from such schools. In 1908 the number of candidates so examined was about 100,000.

Notwithstanding the fact that only a very small proportion of the school children in the United States are examined for admission to college, college admission examinations constitute one of the most powerful influences bearing upon the work of the secondary schools. Teachers in the secondary schools in every part of the United States recognize in the examinations set for admission to college a concrete illustration of generally accepted standards; and institutions like the college entrance examination board are in constant receipt of communications, asking that, by means of the examinations, an attempt be made to influence the methods of teaching various subjects.

It has been urged by eminent educators in the United States that the requirements for graduation from the secondary school and the requirements for admission to the college should be made identical. If this be a true educational principle, its application certainly can not mean that the colleges should be compelled to make their requirements for admission conform to standards determined wholly by the secondary schools. And it seems that it would be quite as unreasonable that the secondary schools should be compelled to make their standards of work conform to requirements established by the colleges, without consideration of the conditions actually existing in the secondary schools.

While examinations for admission to college exercise a powerful influence, this influence may be used either for good or for evil. Before the establishment of the college entrance examination board there existed a state of great confusion. It must be granted, of course, that the admission examinations of many institutions were administered wisely; but it is also true that the examinations of

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many institutions had an effect which was only injurious to the best educational interests. The situation was one in which the secondary schools were unable to make their influence felt in any appreciable degree. Each college felt free to act independently, not only of other colleges, but also of the secondary schools as a whole.

When the college entrance examination board was organized in 1900 the principle of cooperation was made fundamental. The board represents, not only a cooperative effort on the part of a large number of colleges and universities, but also a cooperation between the colleges on the one hand and the secondary schools on the other hand, in respect to a matter of vital importance to both.

The college entrance examination board does not claim the right to formulate definitions of the requirements for admission to college. It accepts definitions that have been drawn up and recommended by representative bodies of experts, recognized as having authority to speak for the subjects concerned. The requirements adopted by the board possess the two important characteristics of uniformity and stability. They can be altered only when the desirability of a change has been approved by a properly representative body of teachers.

Judged merely from the point of view of the colleges, the most important result of the board's operations has been the economy of time, money, and energy in the administration of college-admission requirements. Formerly examinations for admission to college were held only in the larger cities, and it was necessary for each of the more important colleges to maintain its own separate system of examinations.

The most important immediate benefit derived by the secondary schools from the operations of the college entrance examination board is the possibility of unity in class work. Not many years ago it was customary at some of the larger preparatory schools to divide the members of the highest classes into as many different classes as there were colleges to which the students were seeking admission.

But perhaps the greatest and most far-reaching effect of the examinations of the board will ultimately be the raising of the standards of work in the secondary schools. The standards set by the board are, undoubtedly, higher than those set by most individual schools. The board's examinations call for a thorough knowledge of the subject in which it holds examinations and, as the influence of the board spreads, the effect on the schools must be more and more marked.

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SUBCOMMITTEE 1. NATURE OF PROMOTION IN ELEMENTARY SCHOOLS AND ADMISSION TO SECONDARY SCHOOLS.

Any consideration of the nature of promotions in mathematics at once involves the question of examinations, for in practically no schools is a pupil's fitness to pursue more advanced work determined without some written examination, either formal or informal, given either by the class teacher or by some higher authority. Numerous questions arise, therefore, regarding the nature and extent of these examinations, such as, by whom are they given, to what extent are they a factor in determining promotion, how valuable are they as a basis for promotion, are teachers more particular about promotion in mathematics than in other school studies.

These and related questions seemed to constitute proper lines of inquiry for this subcommittee. In order to secure evidence on these points and to get expressions of opinion from teachers and principals of various sections of this country, a questionnaire was prepared and sent to the cities of over 5,000 inhabitants and to typical normal and private schools. The response to this questionnaire was very general, and replies to the number of 427 were received from all parts of the country. The answers disclosed facts as to current practice and gave indications of the trend of professional opinion. Below are given the questions asked in this questionnaire, with a summary of the replies grouped together as accurately as possible under a few general headings:

1. In what grades are mathematics examinations or tests given?

Second	102	Sixth	423
Third	256	Seventh	420
Fourth	394	Eighth	416
Fifth	409	Above eighth	129

2. By whom are the questions made out?

Grade or critic teacher	203
Superintendent	106
Principal	48
Teachers and superintendent, or superintendent	220
State or county authorities	22

3. How often are examinations given?

Monthly or oftener	142
Bimonthly or oftener	55
Quarterly	48
Twice a year	180
Annually	19
Irregularly	124

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4. What are the main purposes of examinations?

Aid in determining promotion or giving marks	99
To compel review	46
To help teacher judge efficiency of her teaching	181
To test knowledge or power of pupils	390

Other reasons given are briefly as follows:

(1) Encourages preparation, stimulates the worker, and prods the lazy.
(2) To cultivate good habits of expression.
(3) As a whip to make pupils work and to satisfy the teacher's desire to see objective results.
(4) To keep teachers on course of study and their pupils up to grade, and to spur children to better appreciation.
(5) To test efficiency of grade and to determine individual needs.
(6) To insure quickness and accuracy in thinking and expression.
(7) To test power to apply knowledge.
(8) For the enlightenment of parents.
(9) To give superintendent a uniform comparison of the work in the whole system.
(10) To accustom pupils to written work.
(11) Urge pupil to make critical preparation, and reach self-reliance.
(12) To act as check upon recitation grades.
(13) Protection of teacher.

5. In your opinion, is the use of mathematics examinations increasing or decreasing at present?

Increasing	110
Decreasing	256
No change	93
Don't know	57
Nature of examination is changing	19

6. Promotion may be dependent solely upon examinations or partly upon examinations and partly upon class work, or solely upon class work. What seems to be the general practice of typical schools in your vicinity?

Solely upon examinations	12
Examinations and class work	327
Mostly or solely upon class work	102
Teachers' impressions	12
About one-third on examinations and two-thirds class work	107

7. How efficacious are written examinations as a means of determining the fitness of a class to do the work of the next grade?

Very helpful	147
Slightly helpful	131
Not relied upon alone	176
Teacher's opinion more valuable	51
Depends upon character of examinations	23

Other opinions are as follows:

(1) They are usually a fair test, except in cases of nervous children who rarely do themselves justice under the strain of an examination.
(2) It depends upon the individual pupil, his temperament, his environment, etc.
(3) It is a poor teacher who can't find out without tests.
(4) A child's work may be good, and yet examinations unsatisfactory.
(5) Not efficacious at all.

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(6) Incentives to application, study, and punctuality.
(7) Not entirely faultless, but as good as any other single scheme.
(8) Useless.
(9) In some instances it appears perfectly satisfactory; in others it is obviously a failure.
(10) Valuable, but chiefly in a supplementary way.
(11) Unfair as means of determining fitness for promotion.

8. Does mathematics in the elementary school differ from other subjects of the curriculum in that a good knowledge of the processes and a reasonable degree of accuracy in manipulaion are indispensable for promotion? Is more care taken to determine fitness for promotion in mathematics than in other subjects, and, if so, why?

Yes	193
No	210
More care than other subjects	155
No more care than other subjects	210
Mathematics more definite and easy to test	59

Other opinions are as follows:

(1) The notion still prevails that mathematics is of preeminent worth.
(2) We do not mean to let mathematics dominate, but the peculiar dependence of each successive step on the last step compels us either to make it too decisive or to reduce the work to a low pressure. In fact we probably do a little of both.

9. To what extent are pupils denied promotion to next grade because of unsatisfactory work in mathematics alone?

Very rarely or never	225
Yes	85
On same basis as other fundamentals	167
Promotion based upon average knowledge and power	35

Other opinions are as follows:

(1) Probably fails more pupils than any other.
(2) Pupils whose work in mathematics alone is unsatisfactory are promoted conditionally.

10. Do you believe that there is an increasing desire for "standardized" tests, i. e., tests in the essentials of mathematics that have been given to enough pupils in representative systems to enable anyone to find out where his pupils stand in the essentials as compared with the pupils of some of the best systems in the United States?

Yes	289
No	92
Not desirable	22
Don't know	55
Desirable	73

GENERAL CONCLUSIONS.

The inevitable vagueness of some of these questions, due to their general nature, makes it impossible to draw conclusions that have statistical accuracy. However, we may venture the following:

(1) Written examinations of one kind or another are given in about all of the elementary schools of the United States. In a considerable number of schools such examinations are given as early as the second grade, but the

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current practice seems to be for them to begin in the fourth grade and continue through the eighth.

(2) There seems to be no regular time for giving examinations. In States such as New York, where there is a strong centralized State system, the annual examination set by the State authorities is the controlling factor in determining the fitness of the pupils to enter the secondary school.

(3) There is no regular custom that determines who shall make the questions of the examinations, although in a large number of schools the examinations are framed by the supervising principal and the superintendent in cooperation with the classroom teacher. In nearly as large a number they are made by the grade or critic teacher alone.

(4) A study of the answers to question 4 of the questionnaire shows that a wide variation of opinion exists among teachers as to the purpose of giving examinations. A majority say that they are "to test the knowledge and power of the pupils," but this is a vague phrase and may express a wide range of meanings. Back of most of the answers given there seems to be the idea that it is very desirable to review carefully the instruction of the classroom and to give the pupils an opportunity to show independently what grasp of the subject they have obtained.

(5) The use of examinations as the chief basis for promotion is apparently decreasing, and the present tendency seems to place more emphasis upon class work than upon the formal examination. Teachers find examinations more or less helpful in determining a pupil's fitness for promotion, but at the same time realize that they are often misleading.

(6) The definite and exact nature of mathematics makes it more easy than in other subjects to measure the results obtained from instruction; consequently many teachers tend to be more careful regarding fitness for promotion in mathematics, but in only a few cases are pupils denied promotion on account of failure in mathematics alone.

(7) There seems to be a pronounced desire throughout the country for standardized tests in mathematics, that is, tests which will enable teachers to measure fairly accurately the efficiency of their instruction and to know whether their pupils are as proficient as those in other localities.

This subcommittee believes that the tendencies in the country as indicated above are along sound lines. Examinations in mathematics as a means of determining fitness for promotion are invaluable, but should not be a controlling factor to the extent of not giving due value to the excellence of daily class work. Such examinations should measure not only the extent to which pupils have mastered the regular work of the course of study, but also their ability to apply their knowledge to new situations. The great need of the future is to develop standards by which schools may measure fairly readily the results of their work. This can be done only after much experimentation and careful study. We need to know more clearly what are the essentials of a course of study, and to devise ways and means of determining whether pupils have mastered those essentials sufficiently well. We should try to reach some consensus of opinion as to what is a proper mastery of the subject matter of the curriculum. A standard may be set so high that much educational waste will result in trying to reach a degree of excellence that does not bring

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an adequate return in practical efficiency. We have at present no reasonable standards that are accepted by a majority of teachers. Many educators feel that this should be the next step forward.

SUBCOMMITTEE 2. ENTRANCE TO COLLEGE BY COLLEGE EXAMINATIONS.

THE RISE OF THE AMERICAN COLLEGE ENTRANCE EXAMINATIONS IN MATHEMATICS.

The practice of examining candidates for entrance into college in mathematics seems to have arisen about the beginning of the nineteenth century, although 150 years before that time candidates for admission to Harvard were required to show proficiency in Latin. It was not until 1802, on the contrary, that mathematics was required of all. At that time the standard for admission was raised, and a knowledge of arithmetic, including the rule of three, was demanded at Harvard. Bowdoin at the same time required the fundamentals of arithmetic. The University of North Carolina called for arithmetic as early as 1795, and Princeton in 1819. By 1825 entrance requirements had become somewhat more systematized. A little algebra was added to the Harvard program in 1819, and in 1825 the applicant was required to know algebra through simple equations including arithmetical and geometrical progression. The standard in arithmetic was quite high, involving much of which the youth of the present day are entirely ignorant: Vulgar and decimal fractions; proportion, compound and simple; single and double fellowship; alligation, medial and alternate, etc. This requirement seems to have been somewhat in advance of what prevailed elsewhere. Yale and the University of Vermont called for arithmetic only. Arithmetic constituted the sole mathematical demand of the University of Pennsylvania in 1833. In 1826 the visitors to the United States Military Academy at West Point reported to Congress that the requirements for admission were low. The University of Virginia has never had entrance examinations.

By 1850 considerable progress had been made in leveling up the standard for admission. Harvard still led in being the only college to require geometry, although at Western Reserve it was stated that a knowledge of algebra and geometry was advisable, though not indispensable. On the other hand, Harvard had fallen into the highly objectionable habit of examining not in subjects, but in particular books. The requirement was Davies's and Hill's arithmetics, Euler's or Davies's algebra to roots, Hill's "Introduction to Geometry as the Science of Form" to proportions. The examinations

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began promptly at 6 a. m. Yale required, besides arithmetic, algebra to quadratics; Columbia called for arithmetic through cube root and algebra through simple equations, substantially the same as was demanded by Princeton and the universities of Pennsylvania, North Carolina, and South Carolina. The University of Vermont more modestly asked for a knowledge of common arithmetic and the elements of algebra, while Oberlin held no examinations, but demanded a six-months' period of probationary residence. It is interesting that the only instance found of a college demanding a knowledge of quadratic equations at this date was the University of Waterville, Me., which required a knowledge of the doctrine of powers and roots sufficient for the solution of equations. It would be interesting to know if these were quadratic equations pure or affected.

The process of raising the mathematical standard for admission continued through the years 1850–1875. In the last-named year Harvard mentions the metric system as a part of required arithmetic, and, what is of much more significance, announces that tables will be supplied for those problems which involve logarithms. The algebra requirement had been extended to include quadratics, and in geometry the first 13 chapters of Peirce's book—i. e., all plane geometry but maxima and minima—are assigned. The geometry requirement at Yale was somewhat less, being Euclid, Books I and II, or Legendre I, III, and IV. Arithmetic was also called for, and Loomis's Algebra to logarithms. Substantially the same demands were made by Columbia, the University of Pennsylvania, and Amherst, while Oberlin had discarded the probationary half year, and called for Olney's Algebra and plane geometry. The academic department of Princeton made a lesser requirement in geometry, only Euclid, Book I, or an equivalent, but in the school of science plane and solid geometry were needed. Cornell and the University of Vermont required arithmetic and algebra through quadratics only.

The changes in the preceding 25-year periods were quite eclipsed by those which took place between 1875 and 1900. The requirement of arithmetic was abolished in most places before the end of the century. At Harvard, in 1900, algebra through quadratics and plane geometry were required of all candidates; advanced algebra, solid geometry, and trigonometry were optional advanced subjects, and an option in analytic geometry had been but recently discontinued for lack of pupils properly prepared. At Yale elementary algebra fell into two parts, the line of division being before quadratic equations. Geometry also was bisected, the second part including problems in mensuration, metric system, and logarithms. For the Sheffield Scientific School, trigonometry, solid geometry, and advanced algebra were requisite to admission. Amherst and Cornell had about the same requirements and options as Harvard, although at the

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latter trigonometry included the right spherical triangle. The same examinations were required at Columbia, the University of Pennsylvania, and Princeton. Columbia, however, had no options, while the latter two omitted the option in advanced algebra. The Princeton school of science continued to demand arithmetic, but made weight at the other end by demanding both plane and solid geometry. While there were many minor differences in the requirements of the various colleges during this period, there was a marked desire to unify the requirements; and that some progress was made to this end is indicated by the fact that a portion of the statement of the entrance requirement in mathematics in the catalogues of Yale and Princeton was the same verbatim for a few years before 1900.

To sum up, the period from 1800–1825 was characterized by the general introduction of mathematical, i. e., arithmetical, examinations for entrance. Between 1825 and 1850 algebra was brought forward, and a faint rumor of geometry might be noticed. Between 1850 and 1875 algebra was moved ahead through quadratic equations, and geometry firmly established. The years 1875–1900 saw the abolition of the requirement of arithmetic and the establishment of optional examinations in subjects of a more advanced grade. It is on the whole remarkable that, in a century when the interchange of views upon academic subjects was much more difficult than at present, the mathematical requirements for admission never differed very greatly; no one college having an unchallenged lead, but all progressing steadily together in the direction of improvement and progress.

PRESENT CONDITIONS.

In recent years an elaborate system of entrance to college by school certificates has developed, and there are at present three well differentiated entrance methods used in the United States. The one requiring an examination in all subjects for admission either by the college or by the college entrance examination board; the second admitting almost entirely by school certificates; and the third a combination of the two other methods, some students being examined by the college and others admitted on school certificate. Examples of colleges for men adhering to the first method are Harvard, Yale, Princeton, Columbia, West Point, Annapolis, Haverford, and the Massachusetts Institute of Technology. Most of the State universities of the West use the second method, that of admitting almost entirely by school certificate. The heads of two of these universities recently authorized the statement that they belived that that method is perfectly satisfactory to all who have had to do with the matter, and that they know of no serious movement for a change.

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THE ARGUMENT FOR THE RETENTION OF THE COLLEGE ENTRANCE EXAMINATIONS AS PRESENTED BY AN EXPERIENCED SCHOOL PRINCIPAL.

In judging of the value of any method of admission to college two aspects must be examined: First, how does it fulfill its primary purpose, namely, to pick out from the mass of applicants those fit to pursue college courses; and, secondly, what are its effects upon the methods of the secondary schools.

It will be admitted that all methods have their unavoidable limitations and fulfill their purpose imperfectly. This is proved by the large number of unfit students dropped by colleges of all types at the end of the first quarter. Against the examination system it is urged that a single paper gives the examiner too slender a foundation for judging of a student's knowledge and capacities, even if it reflected them truly; that this latter is often not the case, because students work under emotionally highly disturbing conditions which handicap the habitually careful but nervous student and favor the one who has been in the habit of taking chances; that there are cram methods of preparing for examinations, by which a superficial gloss may be imparted which will outlast an admission examination but not the test of actual work. Nevertheless every teacher of considerable experience will be ready to testify that undeserved failures are very rare, less so than undeserved success, which is as it ought to be, and that as a whole, the examinations represent the deserts of the students very fairly.

The second aspect of the subject, the effect upon the methods of the secondary schools, is in the opinion of many the more important. The consciousness that at the end of the year the student's knowledge and his ability to apply it will be tested by some one who will judge by results only, stimulates in the highest degree the teacher's thoughtfulness. The student must not only have known his subject some time, but he must have ready command of the whole of it. He must also be trained to clear, neat, and concise presentation, and he must have had frequent opportunities to deal with problems that lie outside his daily prepared work and call for the exercise of independent judgment. Neglect of any of these points will surely lead to disappointing results in the admission examination.

It is quite true that these are the aims of all good teaching, everywhere; but under no system are the rewards for good work so prompt and the penalties for perfunctory teaching so swift as under the examination system. The high degree of stimulation this system gives to thoroughness is its principal recommendation, and in this respect it is thought to be much superior to the certificate system. And it appeals to the stronger students. A teacher in a prominent school states that the weaker students gravitate toward the certificate colleges, which bear, rightly or wrongly, among students very generally the reputation of being easy. As far as the public high schools are concerned there is every reason why it should be so. Wherever there are State universities, public opinion considers graduation from the high school as equivalent to an entrance certificate for the university, and while the grade required for graduation must of necessity be such that a majority of the students can reach it without serious difficulty, every teacher knows that as a matter of fact only a fraction of that majority is fit for more advanced work. Though some schools have attempted to set up one grade for graduation and another grade for a college certificate, this distinction has proved impracticable; and so, why should a student choose greater inconvenience, if the less will apparently land him in the same place?

For all these reasons it seems to those who favor the examination system that that system lays the best foundation for sound scholarship and is best

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adapted to furnish the college a constituency of reasonably homogeneous preparation and that therefore its preservation is desirable.

The introduction of the certificate system means the abolishing of the examinations. The former is the only system in existence west of the Alleghenies. The examination system is in use only in about half a dozen of the eastern colleges, although some of these are the oldest and among the strongest universities in the country. Like the system of admission by examinations the other one has its characteristic strong points, and its equally characteristic weaknesses. Let us examine both.

The certificate system, as President Angell, who was virtually its creator, has said, is a conscious adaptation to American conditions of the German system. In Germany a student who has graduated from the gymnasium passes ipso facto into the university. But in Germany the gymnasium is a State institution; character, time, and extent of its course of study are minutely and carefully elaborated and prescribed, and the carrying out of this plan is supervised by the same authority that controls the university. The articulation is complete, and yet the certificate of maturity is given only after the passing of a severe examination. This examination, it is true, is given by the teachers themselves; but it has previously to be laid before the supervising authorities, who may order any changes they see fit to make, or may reject the paper altogether, and set one of their own.

Here in the United States conditions are very different and the differences are such as greatly to weaken the value of the system. In at least one State the school law prescribes the modus operandi of the formation of high schools and provides for their support, but beyond this it does not go. There is not a word as to subjects, or methods, or extent of study. Every high school is a law unto itself; everything is left to the school district and to the school directors. High schools may be large or small, weak or strong; the teachers well paid or poorly paid; they may know their business or not. And what thus may be is, and a high-school certificate of graduation may have all degrees of value. Just how much it is worth no one can tell, unless he knows the school that issues it. And what has been said of this one State is largely true of the others.

Inspection of schools by the universities, and lists of approved schools, preparatory departments attached to some of the colleges, are intended to remedy some of the disadvantages resulting from the almost total lack of regulation by the State; but especially in the younger States, but in some of the older ones too, the articulation is very loose, and the colleges are much handicapped by the heterogeneousness of the student material they get.

Of course in the larger cities (and they are rapidly multiplying) the means, the will, and the intelligence are at hand for the building up of high schools of high rank, and it is in the relations of those with the colleges that the certificate system appears at its best. The following advantages are claimed for it:

It allows of a natural arrangement of courses of studies, which the examination system sometimes disturbs, on account of the necessity of having all subjects reasonably fresh at the time of the examinations. It enables a school to distribute the work evenly, without congestion at any point; it finally allows the student to step from one institution into the other without the nerve-racking trial of an examination, purely on his merits, as ascertained and set forth by the man who knows him best—his teacher. These are great advantages, and if they were unqualifiedly true would constitute an almost overwhelming argument in their favor. But, beside what has already been said, there are some serious modifying facts to be considered.

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While the examination papers issued by the colleges that admit by that method constitute an authoritative commentary on the real meaning of the definitions of the college standards as set forth in the college requirements, such a criterion is lacking in the case of the certificate colleges; hence there is a certain vagueness on this point.

Inspection of the schools is good as far as it goes. But to be really effective it should be much more frequent and searching than it is. It is true that the performance of the student after entrance is the best criterion of the character of the instruction given at the school, but it takes a number of students and several years to reach a safe conclusion, and by that time the school may, through change in direction and change of teachers, have totally changed.

Finally, and this is probably its weakest point, it puts the burden of responsibility upon the shoulders least able to bear it. The principal of the school may himself have an imperfect or low ideal of what constitutes good work, or he may have the feeling of insecurity of tenure strong enough to make him unwilling to refuse a certificate in certain cases, and quite willing to shift the burden to backs stronger than his own.

Whether the preponderance of advantages or disadvantages lies on the one or the other side, or whether what is true now will continue to be true in the future, it is difficult to decide. The certificate method, if sufficiently safeguarded, would no doubt be the ideal method; but as long as the defects of organization of the high schools are as glaring as they are at present it seems to many that the examination method offers the better guaranties for the fulfillment of the purposes of higher education.

RECOMMENDATIONS AS TO DESIRABLE IMPROVEMENTS IN PREPARING FOR THESE EXAMINATIONS.

As the examination for college admission rests on the methods pursued in the schools, some criticisms and recommendations as to the teaching of mathematics in the schools seem to be in place in this report.

Algebra is usually begun in the first year of the high school without any previous preparation for the use of literal instead of numerical expressions. The opportunity to prepare for this transition in the grammar schools in connection with arithmetic is ordinarily neglected. The massing of definitions in algebra in the beginning of the textbooks is confusing; because of the severely technical language, the definitions are frequently misunderstood and speedily forgotten. This gives a fundamental unsoundness which perseveres. Our textbooks and teachers do not display sufficient skill in grouping the work in each topic; the advance from simple to excessively and needlessly complex examples is too sudden; difficulties introduced merely as difficulties are useless. In the practice of the schools 50 per cent of the pupils forfeit the benefit of this elementary training because in these complex examples a single error vitiates the entire result. The matter of problems is inadequately explained; pupils frequently do not understand that in attacking problems they are called upon to translate conditions from the English language into

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algebra language. Many more problems should be analyzed through and with the pupils, and a method of analysis should be developed.

The subject of factoring is poorly taught. The presentation of factoring under 8 or 10 different cases is misleading to the pupils. They do not study intensively the quantity that is to be factored, but endeavor to guess under what case it is to be rubricated; this is the cause of much trouble. There should be more interpretation of the relations found in an algebraic expression; then the method of factoring will reveal itself naturally to the pupil.

Makers of textbooks forget the immaturity of the pupils and their previous meager mental outfit, and the language of the textbook is frequently lacking in concreteness. In the attempt to compass the whole of the elementary algebra in one year, as undertaken by most schools, the advance from absolute ignorance of the subject to the intricacies of radicals and equations of the second degree is too rapid to promote genuine understanding of the subject matter at this age; it is as though a beginner in Latin were expected in one year to advance from an elementary study of Latin forms to an intelligent grasp of Cicero. The advance should be more deliberate, and at least two years, with about three recitations per week, be devoted to the subject; the pupil needs time to digest. The failures in algebra at examination and the lack of grasp shown in the first college year are frequently traceable to this cause. There should be far more teaching in the class, where the teacher should develop every new subject fully before assigning any part of it for home work. It is wasteful, and even absurd, to let pupils drift without suggestion from the teacher. Home work in the earlier stages of the high school should confirm and reenforce insight gained in the class. Even the errors perpetrated in class may, if immediately traced to their origin, prove a valuable help to knowledge. Such class teaching is far more stimulating to the entire student body than the present system.

Again, our algebra should contain a greater wealth of examples and of problems of moderate difficulty, and these should more frequently refer to conditions in which they actually present themselves to pupils in practical life; that is, by real problems. All mechanical memorizing of rules should be discouraged. The definitions of the textbook should be emphasized as the best and most serviceable expression of algebraic facts and principles, but the pupils' attempts to formulate definitions should not be discouraged; they may be guided toward accuracy.

Geometry.—The lack of all constructional and mensurational work in the earlier school years is a serious drawback; many geometric relations ought to be recognized in the grammar-school period. If geometry in the high school does not precede algebra, it should at least be carried on pari passu.

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The nature of demonstrational geometry as an exercise in logic is not made sufficiently explicit by texts and teachers. The massing of definitions at the beginning of the geometry textbooks, when many of these definitions refer to figures that do not come up for consideration until many months have passed, is bad teaching. The progress in demonstration should at first be very deliberate. Unconventional questioning by the teacher should bring out what the crucial or pivotal point in every demonstration is. There should be variation of the form in which propositions are brought before pupils. Sometimes, instead of the formal language of the theorem, a drawing of the figure and the algebraic expression of relations should be given, together with the crucial point, leaving the pupil to find expression for the hypothesis and the conclusion.

Many believe that plane geometry also should be spread over two years; the system of crowding the plane geometry into one year makes the advance too rapid and discourages the pupils. Three years of five periods per week for the joint study of algebra and plane geometry seem best, the teacher determining according to needs the subject to which two and three hours respectively should be given in each year. Practical applications of theorems in geometry should be at first quite simple. Some of them should follow immediately the propositions which entered into their solution. Another set, not too difficult, should be massed promiscuously at the end of each book of geometry, and at the close of the volume. All possible use should be made of illustrative material, and the pupils encouraged to make occasional models in illustration of principles. Invite students to invent demonstration; even faulty procedure may be turned to good account. Break up the belief that there is only one sequence of propositions; more often even than in algebra does cooperative class work seem the best means to secure intelligent appreciation of topics. The work is slower, but surer. Whilst exceptional pupils may gain satisfaction from unaided pondering over elementary mathematics, the majority of secondary pupils under such a system grope in the dark and lose the valuable stimulus that carefully guided advance furnishes.

RECOMMENDATIONS AS TO IMPROVEMENTS IN SETTING THESE EXAMINATION PAPERS.

Our college-entrance examinations have emphasized, by the test they present, the kind of work which has rendered the elementary mathematics difficult and unattractive. If the object of the examinations is to determine capacity and power, then the questions to be submitted might be distinctly more numerous but less complex. What we want to know after all is whether the student's previous attainment in mathematics has furnished him the tool for further advance in the subject. Readiness, accuracy, ability of individual

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expression, seem to be the main needs; and a mechanically smooth presentation of what has been memorized should be less valuable than a performance which may be unconventional in language but which reveals genuine grasp of the fundamental propositions. This recommendation would therefore culminate in this: That the examination papers should present a larger number of questions, but that in these questions matters of undue complexity should be altogether avoided.

SPECIMEN EXAMINATION.

In order that the nature of the entrance examinations to American colleges may be the better understood, the following specimen papers are appended, with the name of the colleges where they were set:

HARVARD.

(a) Plane Geometry.

(ONE HOUR AND A HALF.)

1. Prove that if two right triangles have the hypotenuse and a side of one respectively equal to the hypotenuse and a side of the other, the triangles are equal.

Draw a square ABCD. On the diagonal AC take the point E so that AE=AB, and draw through E a line perpendicular to AE cutting BC in F. Prove that

$$BF=FE=EC.$$

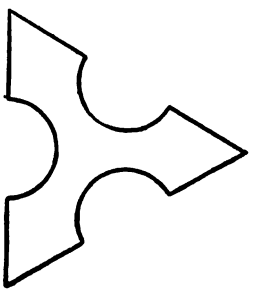
2. Prove that an angle formed by two chords of a circle intersecting each other within the circumference is measured by one-half the sum of the arcs intercepted by its sides and by the sides of its vertical angle.

Take five points, A, B, C, D, E on the circumference of a circle in the order given. Let the middle point of the arc ABC be F, and the middle point of the arc AED be G. Let the chord FG cut the chord AC in H and the chord AD in K. Prove that AH is equal to AK.

NOTE.—The points B and E are used only to indicate the arcs in which the points F and G lie.

3. Given a square with the side 3 inches long. Find the locus of a point P such that the distance from P to the nearest point of the perimeter of the square is 1 inch. Describe the locus accurately.

4. Semicircles are drawn with their centers at the middle points of the sides of an equilateral triangle, forming a figure as here shown.



Prove that if the perimeter of this figure is one-fifth greater than that of the triangle, its area is about one-third less than that of the triangle. If the side of the triangle is 10 inches, what is the area of the figure, correct to 1 per cent?

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5. On the sides of an equilateral triangle ABC as bases equal isosceles triangles ABP, ACQ, BCR, are constructed; the first two are exterior to the given triangle, while R is on the same side of BC as A. Prove that APRQ is a rhombus.

Logarithms and Trigonometry.

1. The length of a side of a regular pentagon is 6 feet. Find the length of a diagonal.

2. A street slopes upward at an angle of 7° 12′. At the foot of the street an arc light hangs at a height of 18 feet above the pavement. How far from the light is a point up the street at which its rays meet the pavement at an angle of 12°?

3. The logarithm of 10 to the base 9 is 1.0480. Find without the use of tables the logarithm of 270 to the same base.

4. Prove that

$$\sin\left(45°+\frac{x}{2}\right)-\cos\left(45°+\frac{x}{2}\right)=\pm\sqrt{1-\cos x}.$$

5. From one corner of a cube lines are drawn in two of its faces making angles of 30° and 40° respectively with the common edge. Find the angle between these two lines.

(b) Elementary Algebra.

1. Find (a) the least common multiple and (b) the greatest common divisor of

$$(x^2+a^2)\ (x^2+a^2);\ (x^2+ax+a^2)\ (3x-a);\ 3x^2+2ax-a^2.$$

2. Solve the equation

$$\frac{9a^3}{x^2}+1-\frac{6a\sqrt{a}}{x}=\left(\frac{3a-\sqrt{a}}{\sqrt{x}}\right)^2.$$

3. Compute the larger of the two roots of the equation

$$x^2=0.100-0.200x$$

correct to three significant figures.

4. Show that $(a+b)^4$ will not be equal to a^4+b^4, unless

$$ab=2(a+b)^2$$

(assuming that neither a nor b is zero.)

5. In a certain town, the tax rate is 2 per cent on both real estate and personal property; under a new system the tax rate would be 5 per cent on real estate, and nothing on personal property. A certain citizen, p per cent of whose property is in real estate, would find his tax bill increased by $100 under the new system; but if the proportion of his real estate and his personal property had been reversed, he would have found his bill reduced one-half. Find the present amount of the bill.

(c) Advanced Algebra.

1. Prove that

$$\frac{a+c}{b+d}>\frac{c}{d}$$

when $\frac{a}{b}>\frac{c}{d}$, b and d being both positive. What is the importance of the statement that b and d are both positive?

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2. In how many ways may a class of 10 students be seated in a room containing twelve seats?

3. Evaluate the determinant

$$\begin{vmatrix} a & b & c & d+x \\ a & b & c & d \\ a & b+x & c+x & d \\ a+x & b & c & d \end{vmatrix}$$

4. Find the value of

$$\frac{21\times 143}{34},$$

the numbers being written in the scale of seven. Perform the indicated multiplication and division in the scale of seven, then change the numbers to the scale of ten and verify your results.

5. One root of the equation

$$2x^5-x^4+3x^3-5x^2-2x-6=0,$$

is $\sqrt{-2}$. Find all the other roots.

6. Find to three decimal places the negative root of the following equation. Use Horner's method.

$$x^3-x+7=0.$$

YALE (SHEFFIELD SCIENTIFIC SCHOOL).

(a) Elementary Algebra.

1. Solve each of the following equations by completing the square:

(a) $x^2+2x=ax+2a$; (b) $2x-7\sqrt{x}+3=0$; (c) $6x^2-5x-5=4\sqrt{6x^2-5x}$.

2. Each of two trains ran 200 miles. One ran 7 miles per hour faster than the other and required one hour and 45 minutes less time. Find the speed of each train. Explain the negative answer.

3. Solve the equation

$$\sqrt{2x-1}+\sqrt{x+3}-\sqrt{3x+2}=0.$$

Verify your answer.

4. Solve the simultaneous equations

$$y^2=2mx+m^2,\ x+y-m=9.$$

Arrange the answers in corresponding pairs and verify.

5. Simplify each of the following:

(a) $\left(\frac{m^2}{n^2}-\frac{n^2}{m^2}\right)\div\left(\frac{m^4+2m^2n^2+n^4}{m^2n-4mn^2}\right)$; (b) $\left(a^4+3a^3+2a^2+2a+1\right)^{\frac{1}{2}}$;

(c) $\sqrt{2}\div\sqrt[3]{4}$; (d) $2\sqrt{\frac{y}{x}}-\sqrt{\frac{x}{y}}+\sqrt{2+\frac{x^2+y^2}{xy}}$;

(e) $\frac{2\sqrt{3-2x}-x(3-2x)^{-\frac{1}{2}}}{x^2}$; (f) $\frac{a^0b^{-1}c^{-2}}{a^{-2}b^0c^3}$.

6. Expand $(x^{-1}+2\sqrt{x})^3$ by the binomial theorem. Write the result in a form free of negative exponents.

7. The first and seventh terms of a geometrical progression are, respectively, $\frac{a}{b}$ and $\frac{b^5}{a^5}$. Find the third term.

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(b) Advanced Algebra.

1. Draw the graphs of the equations

$$\text{(a)}\quad 1-2x-3x^2=0; \qquad \text{(b)}\quad x^3-4x^2-8x+8=0.$$

Solve these equations and indicate clearly the connection of the roots and graphs.

2. Transform $24x^3-2x^2+6x+3=0$ into an equation for which the first coefficient is unity and the others integers.

3. What simple relation exists between the roots of the equation (a) $x^3+3x+5=0$? (b) of the equation $x^3+3x^2+5=0$?

4. Show that the equation $x^3+x^2-8x-5=0$ has three real roots and determine the first figure of each.

5. Calculate a negative root of the equation of 4 to two decimal places.

6. A certain target is divided into 5 concentric rings. Each ring is to be painted a different color. How many color schemes are possible with 8 colors of paint?

YALE.

Plane Geometry.

1. Two right triangles are equal if the hypotenuse and a leg of one are equal respectively to the hypotenuse and a leg of the other.

2. Upon a given straight line construct a segment of a circle which shall contain a given obtuse angle. Prove your construction correct.

3. If three or more nonparallel lines intercept proportional segments on two parallel lines, they pass through a point.

4. If two lines AB and CD cut at E so that $AE \times EB = CE \times ED$, prove that a circumference can be passed through A, B, C, and D.

5. Find the side of an equilateral triangle equivalent to a circle whose radius is 16.

6. Prove that the locus of the extremities of all the equal tangents that can be drawn to a given circle is a circle concentric to the given circle.

7. If the area of a rhombus is a and one diagonal is d, find the length of a side.

8. If a regular hexagon is inscribed in a given circle and another is circumscribed about the same circle, find the ratio of the areas of the hexagons.

9. If two circles are tangent internally, the chords of the greater circle drawn from the point of contact are divided into proportional segments by the smaller circle.

YALE (SHEFFIELD SCIENTIFIC SCHOOL).

Solid Geometry.

1. If two angles not in the same plane have their sides respectively parallel and extending from their vertices in the same direction, they are equal.

2. Prove the theorems regarding the lateral area of a prism and of a regular pyramid. State the corresponding theorems for cylinders and cones.

3. A spherical angle is measured by the arc of a great circle described with its vertex as a pole and included between its sides, produced if necessary.

4. Given two points A and B in space, to find the locus of the center of a sphere of given radius which shall pass through A and B.

5. A rifle shell has the shape of a cylinder surmounted by a hemispherical cap. The total length of the shell is four times its diameter. Compare the surfaces and also the volumes of the cylindrical and the spherical portions.

6. Given a sphere whose diameter is 10 inches. Find the volume and the surface of the inscribed cube.

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PRINCETON.

(a) Algebra to Quadratics. A I.

1. Simplify

$$\frac{x^2}{a+\dfrac{x^2}{a+\dfrac{x^2}{a}}}$$

2. Multiply

$$x^{-\frac{1}{2}}y^{\frac{1}{3}}+x^{\frac{1}{4}}y^{-\frac{1}{6}} \text{ by } x^{\frac{1}{2}}-2y^{\frac{1}{6}}.$$

3. Reduce the following to their lowest common denominator:

$$\frac{1}{6x^2-5x-6},\quad \frac{2}{3+x-2x^2},\quad \frac{3}{2x^3-3x^2-2x+3}.$$

The candidate need not multiply out.

4. Factor $4a^2b^2-(a^2+b^2-c^2)^2$.

5. If $y=\dfrac{a+2t}{b-at}$, find the value of t in terms of the other letters.

6. Solve

$$\frac{3x+2}{x^2+x}+\frac{2(x-5)}{1-x^2}-\frac{x-3}{x^2-x}=0.$$

7. The sum of the three digits of a number is 16; the sum of the first and third digits is equal to the second; and if the digits in the unit's and in the ten's places be interchanged, the resulting number will be 27 less than the original number. What is the original number?

(b) Quadratics and Beyond. A II.

1. Solve the following equations:

(a) $x+1+\dfrac{x^2}{x^2-1}=\dfrac{x^2}{x+1}-\dfrac{5x-4}{1-x^2}$;

(b) $\sqrt{a-x}+\sqrt{a+x}=\sqrt{2a+2b}$;

(c) $(x+2)^{\frac{1}{2}}-(x+2)^{\frac{1}{4}}-2=0$.

2. Solve for x and y, writing the solutions so that the proper values are associated:

(a) $2x-3y-1=0$, $x^2-6xy+1=0$.

(b) $xy=80$, $\dfrac{1}{x}-\dfrac{1}{y}=\frac{1}{5}$.

3. The diagonal of a rectangle is $\sqrt{\frac{5}{2}}$; if each side were increased by 1, the area would be increased by 3. What are the sides?

4. In the expansion of $\left(\dfrac{2x^2}{3}-\dfrac{3}{2x}\right)^8$, find the coefficient of x^4.

5. Find the sum of all positive integers of three digits which are multiples of 9.

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(c) Plane Geometry.

1. The line joining the middle points of the nonparallel sides of a trapezoid is parallel to the bases and equal to one-half of their sum.

2. An angle inscribed in a circumference is measured by one-half the arc intercepted by its sides.

3. Two triangles having an angle of one equal to an angle of the other are to each other as the products of the sides including the equal angles.

4. Given a parallelogram and a point outside of it, obtain a construction for finding the line which passes through the point and divides the parallelogram into two equal parts. Prove the construction.

5. Two parallel tangents of a circle are cut by a third tangent in the points A and B. If O be the center of the circle, prove that AOB is a right angle.

6. If through the point O within a parallelogram ABCD two straight lines are drawn parallel to the sides and making the parallelograms OB and OD equal, prove that the point O is on the diagonal AC.

(d) Solid Geometry.

1. There is one and but one common perpendicular to two straight lines not in the same plane.

2. If two parallel planes are cut by a third plane, the intersections are parallel.

In order to show that two lines are parallel, what must be proved?

3. If an oblique cone of circular base be cut by a plane parallel to the base, this section is a circle.

4. The line AB is perpendicular to the plane a at B; CD is a line in a, and E is the foot of the perpendicular from A on CD. Prove that BE is perpendicular to CD.

5. The length of the altitude of a pyramid is a, and its base is a square, the length of whose edge is b. What is the area of a section parallel to the base whose distance from the vertex is s?

(e) Plane Trigonometry.

1. What is a radian? Express in radians the angles, 60°, −315°.

2. If $\cot\theta=\frac{1}{2}$ and θ is an angle in the third quadrant, find the values of:

$$\sin\theta,\ \cos 2\theta,\ \cos\tfrac{1}{2}\theta.$$

3. Prove geometrically
$\cos(A+B)=\cos A\cos B-\sin A\sin B$, where A, B, and $A+B$ are acute.

4. Prove the following identities:

(a) $\cos(A+B)\cos(A-B)=\cos^2 A-\sin^2 B$;

(b) $\dfrac{\cos^3 x+\sin^3 x}{\cos x+\sin x}=\dfrac{2-\sin 2x}{2}$;

(c) $\dfrac{\tan^2(45°+A)-1}{\tan^2(45°+A)+1}=\sin 2A$.

5. Find all values of x between 0° and 360° which satisfy:

(a) $4\sec^2 x-7\tan^2 x=3$;

(b) $\sin(x-60°)=\cos(x+60°)$.

6. Solve the triangle in which $A=57.15°$, $a=2418$, $b=2368$.

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SUBCOMMITTEE 3. ENTRANCE TO COLLEGE BY COLLEGE ENTRANCE BOARD EXAMINATIONS.

HISTORY.

The college entrance examination board was organized at a meeting held at Columbia University, New York, November 17, 1900, for the purpose of fixing a standard of entrance to American colleges and technical schools.[1]

At this meeting the chief examiners for 1901 were appointed. The associate examiners were named January 12, 1901. The committee of examiners in mathematics consisted, like those in other subjects, of three members, two representing the colleges, and a third, a secondary-school principal or teacher.

The examiners were charged with the duty of framing the questions to be set, and with the preparation of a syllabus of instructions for the guidance of the readers who read and rated the answer books of the candidates. The definitions of the several subjects and topics upon which examinations were held were those recommended by the committee of the National Education Association upon college entrance requirements in cooperation with such bodies as the American Philological Association, the American Historical Association, and others.[2]

In 1904 the requirements in mathematics were modified by the adoption of the recommendations made by a committee of the American Mathematical Society. These recommendations were adopted by almost every college and university in the United States. They constituted a great step in advance toward uniformity and effected considerable simplification in the holding of mathematical examinations. Under this change, elementary algebra was made to include arithmetical and geometrical progressions. Permutations and combinations, and logarithms were excluded and transferred to advanced algebra and trigonometry, respectively.

Examiners.

An examination of the list of examiners in mathematics for the different years will show its representative character. At first the policy of the board was to change completely the personnel of the committee every year. Since 1904 the same members have been continued on the committee for three or four years.

In this way the board has profited more directly by the experience gained in previous years, and the result has been a greater uniformity in the standard set by the papers.

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[1] In Document No. 1, published by the board December 10, 1900, will be found a general statement of the action of the preliminary conferences on the subject of a college entrance examination board, together with a record of the organization of the board and an outline of its purposes and policy.

[2] Report of Secretary, 1901, p. 8.

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EXAMINATION PAPERS.

The subjects of the papers in mathematics were elementary algebra, advanced algebra, geometry, and trigonometry.

During the first years, in order to meet the offerings of candidates with different degrees of preparation in each subject, the paper was subdivided into parts and groups, each group containing three or more questions. In the instructions to the candidate at the head of the paper were indicated the groups from which to choose the requisite number of questions to make up the set in the part of the subject he proposed to take.

Thus in 1901, the paper—Mathematics A—Elementary Algebra—contained 25 lines of instructions to the candidate. It consisted of 30 questions, 15 in part 1—to quadratics, and 15 in part 2—quadratics and beyond. Each part was subdivided into five groups: A, B, C, D, E, and F, G, H, J, K, respectively, of three questions each. Seven different classes of candidates were provided for in this paper, each class being instructed to choose the required number of questions from certain groups. A similar arrangement was made in the papers in geometry, providing for plane geometry only, solid geometry only, or plane and solid geometry; in advanced algebra; and in trigonometry, providing for plane trigonometry only or for both plane and spherical trigonometry.

As the years went by the increase in the number of candidates and more precise definitions of requirements brought about a continuous development in the number and subjects of the different papers, in the instructions to candidates, in the arrangement of the groups, and in the choice of questions allowed. This development has been generally toward simplicity, uniformity, and perhaps some restriction in the range of choice allowed the candidates.

At the present time, as for several years past, each candidate is provided with a separate paper on his particular subject and the instructions are reduced to a minimum. The board now prepares through its committee of examiners in mathematics the following papers:

	Weights.
A–I. Algebra to quadratics	1
A–II. Quadratics and beyond	½
A–I and II. Elementary algebra complete	1½
B. Advanced algebra	½
C. Plane geometry	1
D. Solid geometry	½
C D. Plane and solid geometry	1½
E. Trigonometry (plane and spherical)	½
F. Plane trigonometry	½

These values at the right are the weights of these examinations assigned by the Carnegie Institution for the advancement of teach-

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ing. In these papers the total number of questions ranges from 8 to 10, of which the candidate is required to take from 6 to 8. The instructions at the head of each paper are contained within two or three lines.

THE PLAN OF PREPARING THE PAPERS.

In preparing the examination papers the examiners have a free hand, but generally the work is distributed among the members of the committee: One member undertaking to frame the questions in the elementary algebra papers; another, in geometry; and the third, in advanced algebra and trigonometry. The appointment of subject is determined for the most part by personal preference and special aptitude.

In beginning the work the examiner has before him the papers of previous years. He has also the criticisms and suggestions that have been received during the year at the office of the board and which have been turned over to the committee by the secretary. Under his eyes are the definitions of requirements in each subject printed each year by the board.[1]

When an examiner has prepared his paper he sends a copy to the other members of his committee. After criticisms and suggestions have been offered, the committee meets to consider the papers in detail. No conclusion is adopted which is not agreed to by the whole committee.

The examiners feel that they must set a standard of knowledge and power that will test the fitness of the candidate for college work and satisfy the expectations and requirements of college teachers. The interests of the secondary school are kept in mind, too, and guarded by their representative on the committee and by the committee on revision. After the conference the changes decided upon are made in each paper, and the manuscripts are sent to the office of the board. The papers are then referred in proof to the committee on revision for final consideration and adoption.

The committee on revision under the rules of the board consists of the 15 chief examiners and the 5 representatives of the secondary schools in the board. "The proposed questions are submitted to a searching criticism in this committee with a view to harmonizing their standards of difficulty, and to shaping them toward a recognition of the *best methods of secondary school teaching*."[2] At this conference the discussion of particular questions is often animated and full, but in most cases conclusions satisfactory to all are reached.

The statement of President Nicholas Murray Butler, secretary of the board in 1901, in his annual report of that year, with reference

[1] Document No. 40. Jan. 1, 1909.
[2] Annual Report of Secretary, 1901, p. 7.

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to the papers in all subjects may be quoted here as applying also in general and with aptness to the examination papers in mathematics in 1901 and in subsequent years:

A reading of the questions set in the examinations will show, I think, that they are much more thorough, better balanced, and more searching than those usually set by the colleges individually. This was to be expected, and was a result confidently counted upon to follow from the plan of bringing together several viewpoints, including that of the secondary schools, in the preparation of the questions. Every effort has been made and will continue to be made to obtain from teachers criticisms of the questions used and suggestions for their improvement in subsequent years. So far as answers to requests for criticisms and suggestions have yet reached the secretary, they are almost uniformly commendatory of the questions set, in many cases enthusiastically so. Some teachers are of the opinion that the question papers were in a few cases too long and in some cases too difficult. The one criticism that the board could not afford to face, namely, that the questions set were too easy, has not been made.[1]

METHOD OF READING AND GRADING PAPERS.

The readers are appointed from the colleges, universities, technical schools, and secondary schools, so that the interest will be as varied as possible. Preparatory schools are represented on the board so that the reading may be influenced by those who have had charge of the preparation of the candidate.

This staff of readers, 20 to 30 in number, sits in New York. The first task is to decide what weight shall be given to the various parts of each question. The examiners first indicate what they consider the relative importance of each part of a question, then the readers do so without knowledge of the previous estimate. To insure further uniformity in marking at the outset, each reader is asked to read and rate the same set of about a dozen papers. The ratings of the various readers are then compared and adjustment made until uniformity is reached. After this has been done, the readers are then ready to begin the reading independently.

Those papers which on first reading are rated above 60 are considered no further, but papers whose rating is 60 or below are read a second time by a different reader, and if the two ratings do not agree, the two readers then read the paper together question by question, and discuss it until an agreement is reached.

The papers which any one reader rates 60 or below are not always reread by the same second reader. This also tends toward producing uniformity. When all the precautions are taken into account, it is felt that the variation in rating is reduced to a minimum.

Most of the papers are disposed of in 8 or 10 days. The few papers which come in after that time are read by one of the readers who lives in New York, and those which have to be reread are sent

[1] First Annual Report of the Secretary, 1901, p. 20.

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to the head reader for rereading. As soon as papers are completed, they are reported and tabulated. Frequently finished returns can be sent to candidates within a few days after the close of the examination.

ATTITUDE OF PREPARATORY SCHOOLS.

A letter was sent to every school that furnished 12 or more candidates for the examination set by the board in 1909, containing the following questions:

1. Are the examinations of the college entrance board more difficult than regents'?
2. Are special classes formed to meet the board's examinations?
3. Is there a tendency on the part of the pupils to have a different attitude toward these examinations than toward others?

The answers received from 25 schools were, in general, as follows: (1) Yes, (2) no, (3) no. Some schools regard the board examinations as slightly more serious or more worthy of respect than examinations held by the schools themselves. A changing sentiment was noted, tending toward less awe. Several commented upon the examinations of the board as fair.

At conferences of teachers it was stated that—

1. The examinations in algebra were more uniform than those in plane geometry.
2. The examinations vary according to the ratings previously obtained, e. g., in the year preceding. Thus while one year the examinations may be a little too difficult, the following year they are far too easy.
3. The examination returns tend to show the teaching of geometry in the schools reached by the board is either very good or very poor, for in the examination returns for 1909, of 1,425 pupils who took the examination in plane geometry 49 received 100 per cent, while less than three-fifths of the whole number received as much as 60 per cent.

ATTITUDE OF THE COLLEGES.

On account of the hearty cooperation of the 27 institutions participating in the activities of the board, together with that of the Carnegie Institution for the Advancement of Teaching, the Federation of Associations of Teachers of Mathematics and the Sciences, and the American Mathematical Society, the credentials of the examinations are accepted in practically every institution where they are offered. Most of the colleges have entirely discontinued holding entrance examinations in June on account of the board's examinations.

The New England colleges, with the exception of Harvard, accept the marks of the college entrance board: Yale college, 65; Sheffield Scientific School, Brown, Worcester Polytechnic Institute, University of Maine, 60; Amherst, Boston University, Bowdoin, Dartmouth, Wesleyan, 50. Smith College requires 60 for students who take mathematics in college and 75 for those who do not. Williams re-

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quires 50, except for preliminary credit, in which case 60 is ordinarily required, but for preliminary credit for *a* or *c* (or *b*, *d*, and *f*, if the admission group is IV or V) 75 is required. The Massachusetts Institute of Technology requires 60, except for the combined paper in elementary algebra, when 70 is required. A mark of 70 is also required for trigonometry, which is not an entrance subject for the institute. Harvard University does not accept the board marks at all, but allows students to take the board examinations on condition that the papers are sent to Harvard for marking. A few of the colleges require some papers sent to them for rereading. Some find that their own marks agree quite closely with the board marks, while others find the board marks much higher.

FINANCES.

To defray the expenses of the board each candidate is charged a fee of $5, which entitles him to take any of the examinations held that year and to receive a certificate of credit received in each. Moreover, an annual fee is paid by each of a number of institutions participating in the board. A further source of revenue is from the sale of examination questions and of printed documents. The annual budget is about $20,000. In addition to the direct expenses of conducting the examinations, reading papers, and preparing credentials, a permanent secretary-treasurer is maintained, who has general charge of all its administrative activities. The secretary is Prof. Thomas S. Fiske, post office substation 84, New York City.

PUBLICATIONS.

The annual report of the secretary appears in August of each year. It contains a summary of the action of the board, the names of the examiners and of the readers, a detailed study of the year's candidates, distribution as to residence and school last attended, as well as colleges the candidates expected to enter, a statistical analysis of the results of the examination, and the financial statement of the year. A number of other documents appear from time to time, particularly defining times, places, and other information concerning the examinations for the following year.

The publishing house of Ginn & Co. publishes the complete list of questions set by the board the preceding June, together with the names of examiners and readers and a time schedule of the examinations for the following years.

STATISTICS.

In 1909 examinations were held at 167 points, at which 3,466 candidates participated, the number of books examined in mathematics

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being 4,324. While these figures represent the actual cases treated by the board, its influence is in fact very much wider. With continued cooperation of the various interests concerned it will soon be the dominant factor in defining the standard for entrance to college.

SPECIMEN EXAMINATION QUESTIONS.

In order that the nature of the examinations should be understood, specimen papers in elementary algebra, plane geometry, plane and solid geometry, advanced algebra, and trigonometry are given herewith. Two specimens of each of the first three are given, being those set in 1909 and 1910. Since relatively few candidates try the examinations in advanced algebra and trigonometry, and since many schools do not prepare students in these subjects, only a single specimen of each is given.

Mathematics A I and II—Elementary Algebra Complete.

Six questions are required; two from Group A, two from Group B, and both questions of Group C. No extra credit will be given for more than six questions.

GROUP A.

1. Factor (*a*) $32a^3b^3-4b^6$,
   (*b*) $x^2+2xy-a^2-2ay$,
   (*c*) $a^4-14a^2b^2+b^4$.

2. Reduce to their simplest forms the following expressions:
   (*a*) $\sqrt[n]{\frac{4}{2^{n+2}}}$,
   (*b*) $2x^2\sqrt{9x^2+81}+27\sqrt{4x^2+36}$,
   (*c*) $\frac{ax(a^{-1}x-ax^{-1})}{x^{\frac{1}{2}}-a^{\frac{1}{2}}}$.

3. Show that if $c^2=a^2+b^2$,
   $$a+b+c:b+c-a=a+c-b:a+b-c.$$

GROUP B.

4. (*a*) Solve $(a-b)x^2-a^2x+a^2b=0$.
   (*b*) Solve $\left.\begin{array}{l} x-y=4, \\ \frac{1}{y}-\frac{1}{x}=\frac{4}{117}, \end{array}\right\}$
   and associate properly the values of x and y.

5. The sum of two numbers multiplied by the greater is 126 and their difference multiplied by the less is 20. Find the numbers.

6. (*a*) Construct with respect to the same axes of reference the graphs of $y-x=2$, $y=x^2-4$.
   (*b*) Solve these equations and show the relations between the roots and the graphs.

GROUP C.

7. Show that the coefficient of the middle term of $(1+x)^{16}$ is equal to the sum of the coefficients of the 8th and 9th terms of $(1+x)^{15}$.

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8. (*a*) Derive in terms of a, n and d, from the fundamental formulas or otherwise, a formula for the sum of n terms of an arithmetic progression in which a is the first term and d is the common difference.

(*b*) The sum of the first eight terms of an arithmetic progression is 64 and the sum of the first eighteen terms is 324. Find the series.

(*c*) Sum to infinity the series $1.35+0.045+0.0015+$etc.

MATHEMATICS A I AND II—ELEMENTARY ALGEBRA COMPLETE.

Six questions are required. They must include two questions from Group A, two from Group B, and both questions of Group C. No extra credit will be given for more than six questions.

Group A.

1. Express $\frac{1}{x^3-4x+4}$, $\frac{1}{8-x^3}$ and $\frac{1}{x^4+4x^2+16}$ as fractions having the least common denominator in the form of a product of factors.

2. A man drives to a certain place at the rate of $8\frac{1}{2}$ miles an hour. He returns by a road that is $2\frac{1}{4}$ miles longer at the rate of 9 miles an hour and takes 10 minutes longer than in going. How long is each road?

3. (*a*) Find the value of x from the equation $5x=\sqrt{3}(1+2x)$ and express it as a fraction having a rational denominator.

(*b*) Simplify $(a^4+x^4)\,(a^2-x^2)^{-\frac{3}{2}}-(a^2-x^2)^{\frac{1}{2}}$.

(*c*) Find the square root of $11-6\sqrt{2}$.

Group B.

4. An audience of 360 persons is seated in rows each containing the same number of people. They might have been seated in four rows less had each row contained three more persons. How many rows were there?

5. (*a*) Write down the rth term of the expansion of $(a-x)^n$.

(*b*) In the expansion of $\left(x-\frac{2}{3x^2}\right)^9$ find the value of the term which does not contain x.

6. (*a*) For a certain pamphlet it costs \$100 to prepare the type and 10 cents to produce each copy. If y be the cost in dollars of x copies write down the value of y.

(*b*) Construct a graph—on the scale of one inch to 1,000 copies and the same unit to \$100—to show the total cost of any number of copies up to 3,000. Find from the figure the cost of 2,500 copies and the number of copies costing \$275.

Group C.

7. Solve
$$\left.\begin{aligned} 2x-3y&=12\\ 4x^2+9y^2+21y&=30\end{aligned}\right\}$$

Write the results so that with each value of x the proper value of y is associated.

8. (*a*) Derive a formula for the sum of n terms of a geometric progression whose first term is a and common ratio r.

(*b*) The first term of a geometric progression is 225 and the fourth term is $14\frac{2}{3}$. Find the series and sum it to infinity.

(*c*) Insert four arithmetic means between 9 and 11.

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Mathematics C—Plane Geometry.

Six questions are required; four from Group A and two from Group B. No extra credit will be given for more than six questions.

Group A.

1. Prove that the locus of points equidistant from the sides of an angle is the bisector of the angle.
2. Prove that the perimeter of a convex quadrilateral is less than twice the sum of the two diagonals.
3. Prove that the medians of a triangle meet in a point which trisects each.
4. Prove that in a right triangle the square on the hypotenuse is equivalent to the sum of the squares on the two sides.
5. Prove that two regular polygons of the same number of sides are similar.
6. The diameters of two circular pulleys are, respectively, 12 feet and 2 feet, and the distance between their centers is 10 feet. Find the length of the shortest string which will go around the pulleys, correct to three significant figures.

Group B.

7. Choose two points, A and B, upon a given straight line, and two other points, C and D, upon a straight line perpendicular to AB. Prove that the hypotenuse of a right triangle whose legs are equal to AC and BD is equal to the hypotenuse of a right triangle whose legs are equal to AD and BC.
8. On a semicircle whose diameter is AC take two points, D and E. Draw AD and CE, and let them meet in F; draw AE and CD., and let them meet in G; draw FG.

   Then prove that FG is perpendicular to AC.
9. Let ABC be a triangle with a right angle at C. Draw CD and CE equally inclined to CB, and meeting AB (or AB prolonged) in D and E, respectively. Let M be the mid-point of AB. Prove that MB is a mean proportional between MD and ME.

Mathematics C—Plane Geometry.

Answer four questions from Group A, and two from Group B. No extra credit will be given for more than six questions.

Group A.

1. (*a*) Define a parallelogram.
   (*b*) Prove that the opposite sides of a parallelogram are equal.
2. Prove that in the same circle or equal circles, the less of two chords is at the greater distance from the center.
3. Prove that if from a point without a circle a tangent and a secant be drawn, the tangent is a mean proportional between the whole secant and its external segment.
4. Prove that the perpendiculars from the vertices of a triangle to the opposite sides meet in a point.
5. The lengths of the circumferences of two concentric circles differ by 6 inches. Compute the width of the ring between the two circles correct to three significant figures.
6. Prove that the area of the triangle formed by joining the middle point of one of the non-parallel sides of a trapezoid to the extremities of the opposite side is equal to one-half the area of the trapezoid.

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GROUP B.

7. The three sides of a triangle are, respectively, 4 feet, 13 feet, and 15 feet long. Show that the length of the altitude upon the side of length 15 is 3.2 feet.
8. Through the vertex A of the parallelogram ABCD draw a secant. Let this line cut the diagonal BD in E, and the sides BC, CD (or these sides produced) in F and G, respectively. Prove that AE is a mean proportional between EF and EG.
9. Given two indefinitely long intersecting straight lines, and a point. Find all the points which are equally distant from the two given lines, and at the same time 1 inch away from the given point.

Discuss the number of solutions for different positions of the given point.

Mathematics CD—Plane and Solid Geometry.

This paper will be rated as a whole; separate credits will not be given on this paper for plane geometry and solid geometry.

Eight questions are required; four from Group A and four from Group B. No extra credit will be given for more than eight questions.

GROUP A.

1. Prove that the locus of points equidistant from the sides of an angle is the bisector of the angle.
2. Prove that in a right triangle the square on the hypotenuse is equivalent to the sum of the squares on the two sides.
3. Prove that the medians of a triangle meet in a point which trisects each.
4. On a semicircle whose diameter is AC take two points, D and E. Draw AD and CE, and let them meet in F; draw AE and CD, and let them meet in G; draw FG.

   Then prove that FG is perpendicular to AC.
5. Let ABC be a triangle with a right angle at C. Draw CD and CE equally inclined to CB, and meeting AB (or AB prolonged) in D and E, respectively. Let M be the mid-point of AB. Prove that MB is a mean proportional between MD and ME.

GROUP B.

6. State and prove a formula for the lateral area of the frustum of a regular pyramid.
7. Prove that two symmetrical spherical triangles on the same sphere are equivalent.
8. Given a material sphere, find its diameter.
9. Prove that the edge of a regular octahedron is approximately 2.45 times the radius of the inscribed sphere.
10. A sphere whose radius is 10 inches is cut into two parts by a plane whose distance from the center of the sphere is 6 inches. Find, correct to three significant figures, (*a*) the volume of the sphere, (*b*) the volume of the smaller segment.

Mathematics CD—Plane and Solid Geometry.

This paper will be rated as a whole; separate credits will not be given on this paper for plane geometry and solid geometry.

Eight questions are required, four from Group A and four from Group B. No extra credit will be given for more than eight questions.

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Group A.

1. (*a*) Define a parallelogram.
   (*b*) Prove that the opposite sides of a parallelogram are equal.
2. Prove that if from a point without a circle a tangent and a secant be drawn, the tangent is a mean proportional between the whole secant and its external segment.
3. Prove that the perpendiculars from the vertices of a triangle to the opposite sides meet in a point.
4. Prove that the area of the triangle formed by joining the middle point of one of the non-parallel sides of a trapezoid to the extremities of the opposite side is equal to one-half the area of the trapezoid.
5. Through the vertex A of the parallelogram ABCD draw a secant. Let this line cut the diagonal BD in E, and the sides BC, CD (or these sides produced) in F and G, respectively. Prove that AE is a mean proportional between EF and EG.

Group B.

6. (*a*) Define parallel lines.
   (*b*) Prove that if a straight line is parallel to a plane, the intersection of the plane with a plane passed through the line is parallel to the line.
7. State and prove a formula for the volume of a triangular pyramid.
8. Prove that the area of the surface of a sphere is equal to the product of its diameter by the circumference of a great circle. State a rule for the area of a zone.
9. The corner of a cube is cut off by a plane passing through the mid-points of the edges which terminate at that vertex, and the process is repeated for each corner of the cube. Prove that the volume of the solid that remains is five-sixths of the volume of the cube.
10. Show that the area of a spherical triangle drawn on a sphere whose radius is 10 inches is $(200\pi-270)$ square inches, if the lengths of the sides of its polar triangle are, respectively, 8, 9, and 10 inches.

Mathematics B—Advanced Algebra.

Six questions are required. No extra credit will be given for more than six questions.

1. (*a*) Prove the formula for the number of permutations that can be made of n different things taken r at a time.
   (*b*) How many different words of four letters each, any arrangement of letters being regarded as a word, can be formed from the letters in *Cambridge*?
   (*c*) From a school board of 10 men and 6 women how many different committees can be formed composed of 3 men and 2 women?
2. (*a*) Find the value of the determinant:

$$\begin{vmatrix} 3 & 2 & 1 & 4 \\ 15 & 29 & 2 & 14 \\ 16 & 19 & 3 & 17 \\ 33 & 39 & 8 & 38 \end{vmatrix}$$

   (*b*) Prove: If two adjacent columns of a determinant are interchanged the sign of the determinant will be changed.
3. (*a*) Give and prove the expressions for the coefficients of an equation of degree n, in terms of the roots.
   (*b*) In the equation $x^4+7x^3+x^2-63x-90=0$ the sum of two of the roots is -8, and the product of the other two is -6; find the roots.

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4. (*a*) Find to one place of decimals the approximate values of the roots of the equation $x^3-4x^2+x+4=0$.
   (*b*) Construct the graph of the function and verify the roots obtained.
5. (*a*) Determine the character of the roots of the equation $x^4+15x^3+7x-11=0$.
   (*b*) Show that the equation $x^n-1=0$ has two real roots when n is even; and but one real root when n is odd.
6. (*a*) Transform the equation $10x^4+20x^3-4x^2+25x-30=0$ into another one in which the coefficient of the first term is unity and the other coefficients are integral.
   (*b*) Transform the equation $x^3-5x^2+4x-3=0$ into another one whose roots are 3 greater than those of the given equation.
7. The cube of a number plus six times the number equals 100, find the number to two decimal places.

Mathematics E—Trigonometry (Plane and Spherical).

Six questions are required; three from Group A and three from Group B. No extra credit will be given for more than six questions.

Group A.

1. (*a*) Prove $\sec^2 A=1+\tan^2 A$.
   (*b*) Express in terms of $\cos x$ all the other trigonometric functions of the angle x.
   (*c*) Given the right triangle ABC in which $a=8$, $b=15$, $C=90°$; find the trigonometric functions of the angle A.
2. (*a*) Prove the formula
$$\cos (A+B)=\cos A \cos B-\sin A \sin B$$
   in which A, B, and $A+B$ are all angles in the first quadrant.
   (*b*) Prove $\cos x+\cos y=2 \cos \frac{1}{2} (x+y) \cos \frac{1}{2} (x-y)$.
   (*c*) Derive formulas for $\sin 2A$, $\cos 2A$ and $\sin \frac{1}{2}A$.
3. Two sides of a triangular field measure 243.6 feet and 184.5 feet, respectively, and the angle between them is found to be 105° 36′.
   (*a*) Find the perpendicular distance from one end of the unmeasured side to the opposite side.
   (*b*) Calculate the area of the field.
4. In the oblique triangle ABC, given $a=872.3$, $b=632.7$, $A=60°\ 45'$, find B, C, and c.

Group B.

5. In a right spherical triangle, $C=90°$, prove by a figure any two of the following formulas:
$$\cos c=\cos a \cos b,$$
$$\sin a=\sin c \sin A,$$
$$\cos A=\cos a \sin B.$$
6. (*a*) State Napier's rules of circular parts.
   (*b*) Prove the following relation between the parts of a right spherical triangle, $C=90°$:
$$\cos B \sin b=\tan a \cos c.$$
7. In the right spherical triangle ABC, given $a=132°\ 6'$, $b=77°\ 51$, $C=90°$, find A and c.
8. In an isosceles spherical triangle the equal sides are each 48° 10′, and the angle between them is 100° 6′ 40″, find the third side.

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SUBCOMMITTEE 4. ENTRANCE TO COLLEGE BY STATE EXAMINATIONS.

While several other States have made some progress in this direction, New York is the only State in the American Union that maintains under State control a fully developed system of examinations leading to college entrance. These examinations cover the entire high-school curriculum, and therefore include mathematics through trigonometry. Under these circumstances a report on State examinations for admission to college necessarily becomes a report on the New York State system of examinations.

The history of this system of examinations is interesting and instructive. The general direction of the educational activities of the State of New York is in the hands of a board of regents of the University of the State of New York. This board is entirely nonpartisan. Its members are elected by the State legislature for a term of 11 years, the terms of one or two members expiring each year. The executive officer of the board is the commissioner of education, elected directly by the board of regents to serve during their pleasure. This organization leaves the education department unhampered by any untoward influences, political, sectarian, or otherwise. Early in the history of the State a fund was established for the encouragement and support of secondary education, and this distribution was intrusted to the regents of the university. This fund was distributed among the secondary schools of the State on the basis of the attendance of the academic students. Originally the report of the principal of the school as to the number of such students attending each school was accepted as final and was made the basis of the apportionment, but after a time it became evident that there was a wide divergence of opinion as to what constituted an academic student. In other words, the question of qualification for admission to the academic school was raised, and an examination in preacademic subjects was instituted under the direction of the regents of the University of the State of New York, for the sole purpose of determining who were academic students entitled to be counted in making the apportionment of the academic fund. No other purpose than the one mentioned was then in the mind of anyone, and no extension of the system was contemplated; but as soon as these preacademic examinations had been put upon a substantial basis it was discovered that an increased zeal and an increased interest resulted on the part of both pupils and teachers, and requests for the extension of the system to high-school subjects began to be made by those engaged in secondary school work. In 1877 the regents were by statute directed to establish academic examinations and to furnish a suitable standard of graduation and of admission to college. In 1880 the first academic

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syllabus or summary of requirements was issued, and the examinations have been regularly conducted since that time.

The methods of managing the examination system have developed as the examinations have extended and as experience has indicated the needs of change. At the present time, the general direction of the system is in the hands of the New York State Examinations Board. This board is composed of 20 members who are appointed by the board of regents on the recommendation of the commissioner of education. Five of the members are representatives of the state education department, five representatives of colleges, five representatives of the secondary schools, and five school superintendents representing the elementary schools. This board determines questions of general policy and also appoints committees to prepare the examination question papers in the various subjects.

Each question committee appointed by this board consists of three persons, all of whom must be actively engaged in educational work, one being a representative of a college, one a representative of a high school, and one a representative of the educational department. It is the settled policy of the board that at least one member of each question committee shall be retired each year and a new member shall be appointed in his place. These question committees meet at the capitol in Albany at appointed times and confer on the preparation of the questions to be used at the examination and prepare such questions in manuscript.

After this first draft of each question paper has been thus prepared, the papers are all submitted to a committee of final revision, which is selected from the members of the examinations board, this committee having full power to modify any question paper to any extent that seems desirable or to send back a question paper to the committee that prepared it for revision or for reconstruction.

The question papers, when thus finally prepared, are printed by the education department and distributed to the schools, and the examinations are conducted under the direction of the principals of the high schools of the State in accordance with regulations that have stood the test of 30 years' experience.

The scope of the examinations is quite accurately defined by the academic syllabus. This syllabus is most carefully prepared by committees consisting of the leading educators of the State, drawn from the colleges and the secondary schools, and is regularly revised once in five years to keep it in line with the best educational thought.

Before a student can be regularly admitted to one of these examinations, he must furnish evidence that he has pursued his studies for an adequate length of time in a regularly organized and regularly inspected academic school. When a student has passed examinations in subjects which represent eighteen hours a week of prepared work

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for four school years, an academic diploma is issued by the state department of education, provided the subjects covered meet fixed requirements as to distribution in English, mathematics, history, and science. The college entrance diploma, in two forms, covers the specific requirements for admission to college.

The following important facts are to be noted concerning this system of examinations:

1. The system is not devised by State authorities and imposed upon the schools. Its origin, its growth, and its development are in response to a demand coming from the secondary schools and colleges of the State.

2. The general direction of the system is in the hands of a selected body of representative college and high school men, with the result that the interests of the colleges, of the preparatory schools, and the students themselves are all zealously guarded.

3. The question papers are prepared by committees in which the colleges and the preparatory schools are equally represented, thus insuring standards satisfactory to the colleges and possible of attainment by the high schools.

4. The change in the personnel of each question committee by retiring one of its three members each year provides for the continual infusion of new life and new ideas without the danger of sudden and radical changes in the standards or methods.

5. The schools in which these examinations are held must conform to fixed requirements as to material equipment, teaching force, and course of study, and each of the schools is regularly inspected by an officer of the department.

6. Admission to the examination carries with it the certificate of the principal that the student has satisfactorily pursued the subject in an approved school for an adequate length of time.

7. Each answer paper is examined and rated first by the local school authorities, and if, in the estimation of such authorities, it is found to reach a passing mark, it is forwarded to the central office and there reread and rerated by competent examiners employed by the State.

Moreover, the rating of any paper is subject to reconsideration on appeal, thus insuring fairness to the student and to the school as well as to the college.

From the above statements it appears that a diploma issued in accordance with these regulations virtually carries with it a certificate that the student has pursued the subject satisfactorily under competent teachers for an adequate length of time in a properly equipped school, the work of which is regularly inspected by officers of the State department, and that after such study the student has passed an examination prepared by a committee in which are representatives of both colleges and preparatory schools. Moreover,

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the diploma has inscribed upon its face a list of the subjects in which the student has so passed, with the standing attained in each subject.

Such a system of examinations seems theoretically to meet all the essential requirements for a system of tests for admission to college that shall be absolutely just and that shall conserve the interests of all concerned.

No statistics are available bearing on the results attained by these examinations as compared with the results attained by other methods of admission to college and covering an extensive field. So far as we are able to learn, Cornell University is the only institution where such a study has been made. In the report of the president of that institution for the year 1894–95 it appears that 5.8 per cent of the students admitted on regents credentials were found deficient in their studies in the university compared with 8.98 per cent of those admitted on certificates, and 11.67 per cent of those admitted through entrance examinations conducted by the university authorities, which, of course, includes some who failed to enter in any other way. This study included all the students admitted to that institution for the preceding six years.

The following table shows the growth in mathematical examinations by the regents of New York State by decades:

	1880	1890	1900	1909
Algebra:				
Examined	262	8,771	16,350	31,639
Allowed	242	4,493	10,226	23,540
Advanced algebra:				
Examined	(1)	323	787	1,177
Allowed	(1)	76	423	909
Plane geometry:				
Examined	130	4,561	9,958	18,562
Allowed	106	2,720	5,048	11,936
Solid geometry:				
Examined	(1)	695	1,394	2,676
Allowed	(1)	545	1,132	1,908
Trigonometry:				
Examined	(1)	298	427	1,541
Allowed	(1)	240	316	1,172

[1] Data not available.

SPECIMEN EXAMINATION QUESTIONS.

The following examination papers were set in January, 1911, and show the general nature of the work required by the New York State Education Department:

Advanced Arithmetic.

Write at the top of the first page of your answer paper (*a*) the name of the school where you have studied, (*b*) the number of weeks and recitations a week that you have had in advanced arithmetic.

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Two recitations a week for a school year (or four recitations a week for half a school year), in a recognized academic school, is the regular requirement, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Answer eight questions. No credit will be allowed unless all operations (except mental ones) necessary to find results are given; simply indicating the operations is not sufficient.

1. Prove that 8 is an exact divisor of a number if the number expressed by its three right-hand figures is divisible by 8.

2. Prove that the greatest common divisor of any two numbers is a divisor of their sum.

3. At the same rate per cent, is the 6 per cent method or the exact interest method the more favorable to the borrower? How much more favorable? Explain.

4. On a certain village proposition 112 votes are cast; $\frac{4}{11}$ of the affirmative votes equals $\frac{4}{7}$ of the negative votes. Find the number of votes for the proposition and the number opposed to the proposition.

5. A and B have watches set to Greenwich time. At noon A finds that his watch indicates 25 minutes past 7 a. m.; B finds that his indicates 15 minutes past 4 p. m. Find (*a*) the longitude of each, (*b*) their difference of longitude.

6. If $\frac{1}{8}$ of the time to midnight is the time past noon, what is the time? Solve by arithmetic and give analysis.

7. After 10 pounds of sugar of a certain grade are mixed with 6 pounds of another grade worth only $\frac{2}{3}$ as much per pound, the mixture is worth a cent a pound less than the better sugar; find the price per pound of each grade of sugar and the price per pound of the mixture.

8. The diagonal of a rectangular field is 100 rods; its length is to its width as 4 : 3. Find the number of acres in the field.

9. A cube contains 4,913 cubic inches; find the volume of a cone the diameter of whose base is equal to the length of the cube and whose height is equal to the height of the cube.

10. At what price apiece must steel pens be bought that a dealer may make 100 per cent by selling them at 144 cents a gross?

11. A man sells a certain amount of 5 per cent stock at 86 and invests the proceeds in 6 per cent stock at 103; by so doing his income is increased $1. Find the amount of stock he sold.

12. John Doe borrows from the Albany National Bank $300 for 90 days; he discounts the note at 6 per cent on the day it is dated. Find the face of the note. Write the note with Richard Roe's indorsement.

Elementary Algebra.

Write at the top of the first page of your answer paper (*a*) the name of the school where you have studied, (*b*) the number of weeks and recitations a week that you have had in algebra.

Five recitations a week for a school year, in a recognized academic school, is the regular requirement, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Answer the first six questions and two of the others. No credit will be allowed unless all operations (except mental ones) necessary to find results are given; simply indicating the operations is not sufficient.

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1. Simplify $\left(\frac{1}{x+1}+\frac{1}{x-1}\right) \div \left(\frac{1}{x-1}-\frac{1}{x+1}\right)$

2. Find the prime factors of *each* of the following: $27x^3-64$; $16a-25ab^2$; $16x^2+25y^2+40xy$; x^6+y^6; $x-1+x^3-x^2$

3. Solve for x and y: $\begin{cases} ax-by=0 \\ x-\ y=c \end{cases}$

4. Reduce *each* of the following expressions to its simplest form: $\sqrt{\frac{1}{7}}+\sqrt{63}+5\sqrt{7}$; $(4\sqrt[5]{7}-8\sqrt[5]{21}+6\sqrt[5]{42})\div 2\sqrt[5]{7}$; $\sqrt[4]{\frac{9}{625}}+6\sqrt{\frac{1}{3}}-\sqrt{12}$; $a\sqrt{\frac{x}{a}}+x\sqrt{\frac{a}{x}}$

5. Solve $\sqrt{(3+x)}+\sqrt{x}=\frac{6}{\sqrt{(3+x)}}$

6. Solve $\begin{cases} x^2-xy=3 \\ xy-y^2=2 \end{cases}$

7. The perimeter of a rectangle is 22 inches; if the cube of its length is added to the cube of its width the result is 407 inches. Find the area of the rectangle.

8. A man sold 2 acres more than $\frac{3}{8}$ of his farm and had 4 acres less than half of it left; find the number of acres in the farm.

9. A man invests $\frac{4}{5}$ of his capital at $4\frac{1}{2}$ per cent and the rests of it at 4 per cent; his annual income is $176. Find his capital.

10. If from a certain number the square root of half that number is subtracted, the result is 28; find the number.

Intermediate Algebra.

Write at the top of the first page of your answer paper (*a*) the name of the school where you have studied, (*b*) the number of weeks and recitations a week that you have had in algebra.

Two recitations a week for a school year (or four recitations a week for half a school year) in addition to the five recitations a week for a school year required for elementary algebra, in a recognized academic school, is the regular requirement, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Answer eight questions, selecting two from each group. No credit will be allowed unless all operations (except mental ones) necessary to find results are given; simply indicating the operations is not sufficient.

Group I.

1. Prove that a^{-1}, a^0, and $a^{\frac{3}{4}}$ equal, respectively, $\frac{1}{a}$, 1, and $\sqrt[4]{a^3}$

2. If $x-y$ is a mean proportional between y and $y+z-2x$, prove that x is a mean proportional between y and z.

3. Determine, without extracting roots, which one of the following is the greatest: $\sqrt[3]{10}$, $\sqrt{6}$, $\sqrt[4]{17}$

Group II.

4. Solve $x\sqrt{x}-2\sqrt{x}=x$

5. Solve $\begin{cases} 2x+\sqrt{xy}=10 \\ 3y-2\sqrt{xy}=-1 \end{cases}$

6. Plot the graph of $x^2-4x+3=y$

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Group III.

7. In two years the population of a city increased from 64,000 to 81,000; the rate per cent of increase during the first year was equal to the rate per cent of increase during the second year. What was this rate?

8. Separate the number n into three parts such that the first is to the second as a is to b and the second is to the third as c is to d.

9. Find the square root of $5x^2-23x^4+12x+8x^5-22x^3+16x^6+4$

Group IV.

10. Show that the fraction $\frac{x^n-\sqrt{x^{2n}-4}}{2}$ is the reciprocal of the expression $\left(\frac{\sqrt{x^n+2}+\sqrt{x^n-2}}{2}\right)^2$

11. Simplify $\dfrac{\frac{a^2+b^2}{b}-a}{\frac{1}{b}-\frac{1}{a}}\times\frac{a^2-b^2}{a^3+b^3}\times\left(\frac{a+b}{a-b}+\frac{a-b}{a+b}\right)\times\left(\frac{a}{a+b}+\frac{b}{a-b}\right)$

12. Write in its simplest form the quadratic equation whose roots are $a+b\pm(a-b)\sqrt{-1}$

Advanced Algebra.

Write at the top of the first page of your answer paper (a) the name of the school where you have studied, (b) the number of weeks and recitations a week that you have had in algebra.

Five recitations a week in algebra for two school years, in a recognized academic school, is the regular requirement, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Answer eight questions. No credit will be allowed unless all operations (except mental ones) necessary to find results are given; simply indicating the operations is not sufficient.

1. How many planes are determined by 30 points if no four of the points lie in the same plane?

2. Divide $8-4\sqrt{-1}$ by $3+4\sqrt{-1}$. Find the 6th term and the sum of the series of $\sqrt{\frac{3}{2}}$, 1, $\frac{\sqrt{3}}{\sqrt{2}}\cdots$

3. Prove that $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (a-b)(b-c)(c-a)$

4. Show by the binomial theorem that

$$\sqrt{10}=3\left\{1+\frac{1}{2\times 9}-\frac{1}{8\times 9^2}+\cdots\right\}$$

and continue the series *three* terms further.

5. Apply the method of undetermined coefficients to develop the following fraction to *five* terms of a series in ascending powers of x: $\frac{1+x}{1-x-x^2}$

6. Prove that if two integral series, arranged to ascending powers of x, are equal for all values of x which make them both convergent, the coefficients of like powers of x are equal.

7. Prove that $\log ax=\log bx\times\log ab$ and that $\log ba\times\log ab=1$.

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8. Prove that an equation of the nth degree has n roots and only n roots.

9. If $a+b\sqrt{-1}$ is a root of an equation with real coefficients, prove that $a-b\sqrt{-1}$ is also a root of the equation.

10. One root of the equation $x^4-2x^3-9x^2+10x+7=0$ lies between -2 and -3; find by Horner's method the value of this root to *two* places of decimals.

11. Construct the graph of $\frac{1}{2}x^2-x+2=y$ from $x=-4$ to $x=+4$. Determine approximately by graphic methods (a) a negative root, (b) the positive value of x that will produce the least value of $\frac{1}{2}x^2-x+2$.

12. Prove that $x^7+2x^5-5x^3-4=0$ has *one* positive real root and *six* complex roots.

Plane Geometry.

Write at the top of the first page of your answer paper (a) the name of the school where you have studied, (b) the number of weeks and recitations a week that you have had in geometry.

Five recitations a week for a school year, in a recognized academic school, is the regular requirement, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Answer eight questions, selecting two from each group.

Group I.

1. Prove that the sum of the exterior angles of any polygon, made by producing the sides in succession, is four right angles.

2. Prove that every point in the bisector of an angle is equally distant from the sides of the angle.

3. Prove that the medians of a triangle intersect in a point which is two-thirds of the length of each median from its vertex.

Group II.

4. Prove that if two circles intersect, their line of centers is perpendicular to their common chord at its middle point.

5. Prove that a tangent to a circle from an exterior point is a mean proportional between a secant from the same point and the external segment of the secant.

6. Prove that the area of a triangle is equal to half the product of its base by its altitude.

Group III.

7. Find the area of a circle inscribed in an equilateral triangle whose side is 10 inches.

8. The area of a trapezoid is 204 square inches; its altitude is 17 inches; and one base is 16 inches. Find the other base.

9. With the vertices of a square as centers, four equal circles are drawn so that each circle touches two others; the part of the square not covered by the circles equals 85.84 square inches. Find the radius of each circle.

Group IV.

10. Construct a square equivalent to the sum of two squares whose areas are 81 and 144, respectively. Prove your construction.

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11. Construct a triangle equivalent to a given pentagon. Prove your construction.

12. Construct a mean proportional between two given lines. Prove your construction.

Solid Geometry.

Write at the top of the first page of your answer paper (*a*) the name of the school where you have studied, (*b*) the number of weeks and recitations a week that you have had in solid geometry.

Two recitations a week for a school year (or four recitations a week for half a school year), in a recognized academic school, is the regular requirement, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Answer eight questions, selecting two from each group.

Group I.

1. Prove that if two trihedral angles have the face angles of one equal to the face angles of the other, their homologous dihedral angles are equal.

2. In how many ways may squares or equilateral triangles be grouped about a point to form a convex polyhedral angle? Explain.

3. Prove that if a straight line is parallel to a plane, the intersection of the plane with any plane passing through the given line is parallel to the given line.

Group II.

4. Prove that two tetrahedrons having a trihedral angle of one equal to a trihedral angle of the other, are to each other as the products of the edges including the equal trihedral angles.

5. Prove that the volume of a triangular pyramid is equal to one-third of the product of its base by its altitude.

6. Find the altitude of a triangular pyramid, every edge of which is 10 inches.

Group III.

7. Find the volume of a spheric shell whose inner radius is 10 and whose outer radius is 20.

8. Prove that the volume of a spheric sector is equal to the area of the zone which forms its base multiplied by one-third the radius of the sphere.

9. If the earth is a sphere of radius r, what is the area of the zone visible from a point whose height above the surface of the earth is h?

Group IV.

10. The sides of a triangle are each 12.49 inches; what is the volume generated if the triangle revolves about one side?

11. Prove that a section of a sphere made by a plane is a circle.

12. What is the locus of the centers of spheres whose surfaces are tangent to all three sides of a given triangle?

TRIGONOMETRY.

Write at the top of the first page of your answer paper (*a*) the name of the school where you have studied, (*b*) the number of weeks and recitations a week that you have had in trigonometry.

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One recitation a week for a school year (or two recitations a week for half a school year), in a recognized academic school, is the regular requirement for admission to the examination in plane trigonometry or spheric trigonometry, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Candidates for plane and spheric trigonometry will answer five questions, selecting one question from each group except Group III. Answers 20 credits each.

A, B, and C represent the angles of a triangle, a, b, and c the opposite sides. In a right triangle C represents the right angle.

Give special attention to arrangement of work.

Plane Trigonometry.

Candidates for plane trigonometry will answer five questions from Groups I, II, and III. Answers 20 credits each.

Group I.

1. Prove the identities $\frac{\sin x}{1+\cos x} + \frac{1+\cos x}{\sin x} = 2\csc x$

$$\cos x \cos y = \tfrac{1}{2} \{ \cos (x+y) + \cos (x-y) \}$$

2. Given $\tan x = \frac{b}{a}$, $\tan y = \frac{a-b}{a+b}$; show that $\tan (x+y) = 1$

Group II.

3. In a plane triangle given two sides and an angle opposite one of them; explain with diagrams when there are two solutions, one solution, and no solution.

4. In a plane triangle show that the ratio of any side to the sine of the opposite angle is equal to the diameter of the circumscribed circle.

Group III.

5. A lighthouse was observed from a ship to bear N. 34° E.; after the ship had sailed due south 3 miles the lighthouse bore N. 23° E. Find the distance from the lighthouse to the ship in each position.

6. In order to find the distance between two objects A and B separated by a swamp, a station C was chosen and the distances $CA=382.5$, $CB=347.6$, together with the angle $ACB= 62° 31'$, were measured; what is the distance AB?

Spheric Trigonometry.

Candidates for spheric trigonometry will answer five questions from Groups IV, V, and VI. Answers 20 credits each.

Group IV.

7. Deduce the following formulas for the solution of right spheric triangles:

$$\cos c = \cos a \cos b$$
$$\sin a = \sin c \sin A$$

8. Prove that in a right spheric triangle an oblique angle and the side opposite are either both less or both greater than 90°.

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GROUP V.

9. In a right spheric triangle given $B=33° 50'$, $a=108°$; find A and c.
10. In a right spheric triangle given $B=80°$, $b=67° 40'$; find A and a.

GROUP VI.

11. In a spheric triangle $A=132°$, $B=140°$, $b=127°$; find a.
12. In a spheric triangle $a=64° 24'$, $b=42° 30'$, $C=58° 40'$; find A and B.

SUBCOMMITTEE 5. ENTRANCE TO COLLEGE BY CERTIFICATION.

HISTORY.

The first suggestion looking toward the admission of students on certificate from the high schools is contained in the report of Acting President Frieze, of the University of Michigan, for the year 1869–70. In this we read:

As a means of strengthening, consolidating, and elevating the whole State system, some of our best educators both in the local schools and in the university have proposed that a commission of examiners from the academic faculty should visit annually such schools as may desire it and give certificates to those pupils who may be successful in their examinations, entitling them to admission, without further examination, to the university.

At a meeting of the faculty of the department of literature, science, and the arts of the University of Michigan held November 14, 1870, a resolution was passed looking to the appointment of a committee—

to see if some system can not be devised by which the high schools of the State can be brought into closer connection with the university, the committee to report so early that their report can be placed in the next edition of the catalogue.

At a meeting of the faculty held February 27, 1871, on recommendation of this committee the following statement was ordered introduced into the catalogue:

SPECIAL NOTICE TO PREPARATORY SCHOOLS.

Whenever the faculty shall be satisfied that the preparatory course in any school is conducted by a sufficient number of competent instructors and has been brought up fully to the foregoing requirements, the diploma of such schools, certifying that the holder has completed the preparatory course and sustained the examination in the same, shall entitle the candidate to be admitted to the university without further examination.

At a meeting of the faculty held May 1, 1871, a resolution was adopted to the effect—

that the high schools of the State which are desirous of connecting themselves with the university in the manner indicated in the last annual catalogue be

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informed that, after they have made application through their board with a statement as to their courses and the number of teachers employed, a visitor from the faculty will be sent to them and this department will act on his report.

In his report for the year 1870–71 the acting president says:

The effect of this plan of annual examination, which is, of course, to be matured and perfected by experience, will be to stimulate the schools to a higher grade and bring them to a more perfect uniformity of preparation, and thus make it possible to elevate the scholarship of the lower classes in the university. But more than this, it creates at once a reciprocal interest between the schools and the university, and also wins for the university a livelier interest on the part of the citizens whose schools are brought into such close connection with the institution. * * * The principle of this movement is obvious. We go back to the schools and aid their instructors in devising correct plans and laying solid foundations of scholarship, instead of waiting until pupils present themselves at the university prepared under dissimilar and, perhaps, erroneous systems, often imperfectly prepared, and sometimes rejected for deficiencies which could have been obviated by this previous interchange of views between the faculty and the preparatory teachers.

The system actually wrought out does not in every respect conform to the plan here suggested. The university sends a commission to examine schools, and to approve such as are found worthy, for periods of from one to three years according to the merits of the schools. The student who comes with proper certificate from one of these approved schools is admitted at once. The examination of the school includes the courses of study, the teaching, the equipment of the school in the way of laboratories and libraries, and its discipline and spirit.

The schools have been stimulated to a higher grade of work; the preparation for the university has been made more uniform, and the scholarship of the lower classes has been elevated; a closer reciprocal interest between the schools and the university has been created, and a livelier interest in the university awakened in the public mind. To be sure, other causes have worked to the same ends, but this one has been pronounced and unmistakable. On the side of the school, the superintendent, the principal and teachers look to the visits of the examiners with interest, as occasions for comparing notes, rectifying errors, discussing policies and methods, and receiving fresh stimulation. In a word, they receive from the university the most practical and useful report on their work that it is possible for them to receive. The pupils, too, feel the significance of the inspection. More than this, boards of education often, if not generally, interest themselves in the visitation. Seeking out the visitors, they have questions to ask about studies, teachers, and the organization and spirit of their schools, in order that they may more fully bring them into line with university ideas. On the whole the schools desire the visits to be more frequent rather than less frequent; and if it were seriously proposed to discontinue them altogether, strong opposition would come from this quarter. On the side of the university, the faculty, in the most practical and direct of ways, renews its acquaintance with the schools. Faculty discussions and decisions are guided in no small degree by the observations of the professors who have seen the teachers and the pupils in the schools. The feeling is gen-

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eral that the university must keep in touch with the schools; and when forward steps are proposed the question is sure to be asked, What are the schools prepared to do?[1]

As the list of schools seeking approval grew larger and larger the burden of inspecting these schools became too great for the faculty committees so that now there is a man under regular appointment on the faculty as assistant professor of education and inspector of schools, whose attention is largely given to the work of inspection in which other members of the faculty take no part save on very rare occasions when their service is specifically called for.

To satisfy a natural curiosity as to the working of the system of admitting students on certificate from approved schools a committee appointed in March, 1876, made a careful study of the results of the semester examinations of all the freshmen admitted since 1871. In 1880 a still more exhaustive study was made of all the data bearing on the question from 1871 to 1880. One of the items of the report of the committee was the following:

The average percentage of success of 351 diploma students for the first seven years that the diploma system was in operation was 88.36. The average percentage of success of 442 students admitted on examination for the same period was 86.50. The corresponding figures for the last two years, 1878–1880, were, respectively, 90.56 and 89.61. The percentages are very slightly in favor of the students admitted on diploma.

Since that time the question has not been reopened. The relative number of students admitted on certificate has gone on steadily increasing until now but very few are admitted on examination. The plan originated at the University of Michigan is now in force, with modifications, of course, in all the leading colleges and universities of Michigan, Ohio, Indiana, Illinois, Wisconsin, Minnesota, North and South Dakota, Iowa, Kansas, Nebraska, Colorado, Montana, Wyoming, Missouri, and Oklahoma.

At a comparatively early period in the history of the movement the authorities of the University of Michigan were invited to inspect schools outside of the State and the invitations were accepted to a considerable extent. Other institutions followed the example till finally certain high schools of the first class were examined by inspectors representing several different States. The situation became embarrassing.

In the year 1895 a meeting was held at the Northwestern University, in Evanston, Ill., which led to the organization of the North Central Association of Colleges and Secondary Schools, whose avowed object is to establish closer relations between the colleges and secondary schools of the North Central States. This association soon

[1] From a paper by Prof. Hinsdale read at one of the early meetings of the North Central Association of Colleges and Secondary Schools.

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showed vigor and enthusiasm. Its discussions were stimulating and instructive. At the meeting held in 1901 Prof. Whitney, of the University of Michigan, read a paper on "The problem of harmonizing State inspection by numerous colleges so as to avoid duplication of work and secure the greatest efficiency." As a result of the discussion which followed a committee was appointed which brought in the following recommendations:

We recommend that the association do now proceed to the establishment of some definite form of affiliation and credit, as fixed, comprehensive, and uniform as may be, between the colleges and universities of this association and the secondary schools of the North Central States, and to this end we make the following further recommendations:

(1) That a permanent commission be formed to be called the commission on accredited schools and to consist, first, of 12 members to be appointed by the chair, 6 from the colleges and 6 representing the secondary schools; and second, of additional or delegate members, one from each college or university belonging to the association which has a freshman class of at least 50 members and which may appoint such representatives, together with a sufficient number of members from the secondary schools, to be appointed by the chair, to maintain a parity of representation as between the secondary schools and the colleges. * * *

(2) That it be made the duty of this commission to define and describe unit courses of study in the various subjects of the high-school program, taking for the point of departure the recommendations of the national committee of thirteen; to serve as a standing committee on uniformity of admission requirements for the colleges and universities of this association; to take steps to secure uniformity in the standards and methods, and economy of labor and expense in the work of high-school inspection; to prepare a list of high schools within the territory of this association which are entitled to the accredited relationship; and to formulate and report methods and standards for the assignment of college credit for good high-school work done in advance of the high-school requirement.

The number of high schools accredited to the association for the year 1909, whose graduates may be admitted on certificate to any of the colleges or universities belonging to the association, is 595, distributed as follows: Colorado, 31; Illinois, 97; Indiana, 42; Iowa, 50; Kansas, 17; Michigan, 74; Minnesota, 44; Missouri, 28; Montana, 1; Nebraska, 24; North Dakota, 5; Ohio, 93; Oklahoma, 2; South Dakota, 15; Wisconsin, 71; Wyoming, 1.

Each State university inspector reports favorably on quite a number of schools not yet of sufficiently high standing to be put upon the list of the North Central Association. In this way encouragement is given to schools whose condition is steadily improving.

At the University of Michigan very close watch upon the product of the approved schools whose students are admitted on certificate, both during the semester and at the time of examination, is kept, so as to be able to pass judgment on the individual school as to whether it shall be kept on the list.

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This history of admission on certificate to the University of Michigan has been related for two reasons:

First. Because the system had its origin at that institution.

Second. Because its development throughout the Middle West has been along the same lines.

The next event in this connection worthy of attention is the establishment of the certificate system at the University of California.

From the opening of the university in 1869 to 1884 entrance was by examination. The accrediting of secondary schools in California was authorized by the regents of the university in 1884. For the following 19 years those schools which desired to avail themselves of the accrediting system made annual application to the university. Four or more examiners each year went to each school and investigated the work. The result was a better understanding of conditions and relations, which led to the naming of the majority of the high-school teachers by the university.

In 1891 the State authorized the establishing of union district high schools, and in the act it required that at least one course of study should prepare the student for entering the State university.

By 1893 the number of high schools had so increased in number that the method of visiting was changed. A university examiner, who is a professor in the department of education, undertook the work of general supervision of the 200 high schools of the State, of which 150 are now on the accredited list.

The method that has been pursued by the University of California has been so distinctive and thorough that in many parts of the world it is known as the California method. No other State university has exercised so much control over the high schools, and none but a State university could.

The principal difference between the California and the Michigan plans was the thoroughness of inspection at the former university. There, at first, each department of instruction in the high school was examined by a member of the same department of the college faculty. Instead of approving the school and accepting the diploma, departments of the school were approved. As the number of schools increased, this method was modified first by allowing one member of the faculty to examine for some other subject kindred to his own, and finally, as stated above, by delegating the whole inspection to a special member of the department of education. His work in this respect has so much increased that he has requested an assistant, as the amount of inspecting that he can do has fallen below what he regards as a minimum.

In the part of the country so far considered the growth of the certificate system was closely connected with that of the State universities. The basis of it was the idea of a State system of education of which the university was an integral part. It was felt that it

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should be no more difficult in such a system to pass from the high school to the university than from one grade to another. The denominational or endowed college was largely overshadowed by the State university and compelled to accept its lead in this respect.

In the East the situation was entirely different. The denominational and endowed colleges and universities had the field almost entirely to themselves. They had no such power over the public schools, or over the distinctly preparatory schools, as the State universities of the West had over the secondary schools of that region. The theory in the East was that the college set the standard of admission and was chiefly concerned as to the best method of enforcing it. It was believed that the high-school teacher, who had known the pupil for three or four years, was better able to say whether or not the standard of the college had been met than the examiner, who had only the written work of a few hours to depend upon. In practice, here as elsewhere, some institutions seemed to be swayed too much by a desire for increased numbers, but this was by no means generally true.

Notwithstanding the difference in the point of view, the certificate system appeared in New England as early as 1874 and has now spread over practically the whole of New England and the Middle States. Only three institutions in New England—Harvard, Radcliffe, and Yale—admit only by examination. All the others admit both by examination and certificate. One, the Institute of Technology, of Boston, accepts certificates in only such subjects as are not regarded as preparatory for courses required after entering the institute. Amherst and Williams refuse to accept certificates in French and German. The Rhode Island State College requires that the record of the applicant in the school at which he was prepared be submitted, and admits or rejects him on the basis of this standing. Some practically accept the certificate of any school, while others have an approved list from which they receive certified pupils. There was no attempt at uniformity and in most cases no systematic scrutiny of the approved list until the formation of the New England college entrance certificate board.

The commission of colleges in New England on admission examinations, at its annual meeting in May, 1900, *Voted:* That a committee of three be appointed to gather information upon the method of administering the certificate system by the colleges represented on the commission which employ it, and to report what in their judgment may render it more efficient and uniform.

This committee made an extensive report[1] at the annual meeting in 1901. The commission passed the vote recommended by the committee and also, *Voted:* That the colleges that shall adopt the above

[1] Fifteenth Annual Report of the Commission of Colleges in New England on Admission Examinations, pp. 7–16.

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recommendation be requested to appoint, before the close of the college year, delegates, one from each college, to meet at such time as may be arranged for by the executive committee of this commission, and to form a definite plan for the organization and work of the board herein provided for.

In response to this request delegates from nine New England colleges met on the 31st of January, 1902, and voted to recommend to the colleges the establishment of a board, composed of one member from each college, for the purpose of receiving, examining, and acting upon all applications of schools that ask for the privilege of certification. They also adopted certain general provisions[1] under which the board should be organized. One of these provided that the assent of seven colleges should be necessary for the establishment of the board.

On May 16, 1902, eight colleges having assented to the general provisions, their delegates met and organized the board. Since then five more colleges have been admitted. The board limits its jurisdiction to schools located in New England, and the colleges agreed not to accept the certificate of the principal of any school in New England not approved by the board. The first list of schools was adopted October 22, 1903, others were added May 20, 1904, and the first complete list was used by the colleges for the class entering in 1904.

In preparing the list of approved schools, the board considers: First, whether the school in respect to the number and training of its teachers, its curriculum, and its equipment, is able to prepare properly a student for admission to some course leading to a degree in some one of the colleges represented on the board; secondly, whether the certificate of the school can be depended upon. In the opinion of the board, the second question is the more important. If the students certified by the school successfully pass the work of the first term in college, the board retains the school on the approved list. The board desires to encourage individuality on the part of the school and emphasizes results rather than methods. For this reason, when a school applies for the first time, the board will not consider the application until at least two have entered on examination within three years some one or more of the colleges belonging to the board. If accepted, the school is first placed on a trial list for one year, so that the board may be able to judge of what the school considers a proper preparation for college. If satisfactory, the school will then be approved for a period of three years. On application the approval will be extended for a period not exceeding three years if the record remains satisfactory. The board reserves the right to drop a school from the list of approved schools at any time if the reports are unsatisfactory. Usually when a school has been approved for

[1] See the First Annual Report of the New England College Entrance Certificate Board, 1902–3.

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three years, a warning notice will be sent to it on receipt of the first bad report, and if the work is not improved during the next year the school is dropped. Even though the reports received from all the colleges except one are good, if the school continues to send unsatisfactory pupils to that one, it will be dropped. Also, if the reports are poor in only one subject and no improvement is shown, the school is dropped. The board makes some allowance for the fact that a boy may go to pieces under new and strange surroundings, but it believes that this should be the exception and not the rule.

For the year 1909–10 there were on the approved list of the New England board 286 schools, and on the trial list 34 schools, or 320 schools from which pupils could be received on certificate. These were distributed among the States as follows: Maine, 54; New Hampshire, 33; Vermont, 25; Massachusetts, 158; Rhode Island, 17; Connecticut, 33.

In the Middle States conditions are now about as they were in New England before the formation of the board. Three colleges—Princeton, Columbia, and Bryn Mawr—receive only by examination. The others accept certificates. Efforts have been made within the last two years to establish a college entrance certificate board of the Middle States and Maryland, with functions similar to those of the corresponding New England board. So far the attempt has been unsuccessful.

RESULTS.

In the part of the country west of the Middle States general satisfaction with the certificate system seems to prevail. Some connected with the endowed institutions complain that they have little influence over the secondary schools and are compelled to accept certificates of schools approved by the State universities, whether they wish to or not. Some teachers in the State institutions also complain of the results. One of them says, "I am continually fighting the faculty, local board, and State board for a higher standard in mathematics, mechanics, and physics. But as the State board controls secondary and State institutions, we are required to take what is sent." Another correspondent, a teacher in an endowed college with a preparatory department, says, "Church schools are too weak to dictate terms, and we have practically no influence in shaping high-school courses. The State superintendent and State university control us. Those we train in preparatory work surpass those trained in high schools."

These are exceptional reports. Most of those reporting seem satisfied with present results. Probably 80 or 90 per cent are admitted on certificate throughout this part of the country.

The number of students now entering the University of California by examination is so small, as compared with those who enter

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by certificate, that comparisons of relative efficiency can not be well made. However, a careful examination covering a period of ten years, from 1884 to 1894, during which time the average number admitted by certificate was equal to the number admitted by examination, has shown: (*a*) That those who were admitted upon examination, without condition, did better work in their freshman year than those admitted on certificate. (*b*) That those admitted on examination with one condition did better work than those admitted on certificate. (*c*) That those admitted on examination and having two conditions did not do such good work as those admitted on certificate. (*d*) That the few who were admitted with three conditions did very little satisfactory work.

A member of the faculty reports that he was opposed to the plan at the time it was adopted. He foresaw the evils more clearly than the benefits. After 25 years of experience with accrediting he is ready to say that the benefits outweigh the disadvantages.

As far as reports have been received by the committee, most college men in New England and the Middle States, outside of the institutions which admit only by examination, are fairly well satisfied with the results obtained by the certificate system. This is especially true of those connected with colleges forming the New England board. The secondary school principals are divided. Many object to the responsibility which they claim has been thrust upon them.

The only statistics available concerning the results obtained from the certificate system in New England are those published in the annual report of the New England College Entrance Certificate Board. From these, it is seen that the per cent of unsatisfactory pupils has greatly decreased in the principal subjects offered for admission since the establishment of the board. This is shown in six subjects by the following table taken from the seventh annual report:

Students received on certificate.

	English.	Latin.	Greek.	French.	German.	Mathematics.
Number certified in 1908–9	1,161	960	275	846	621	1,104
Number who failed first term 1908–9	85	33	4	39	39	136
Per cent who failed first term—						
1908–9	7.3	3.4	1.5	4.6	6.3	12.3
1907–8	7.8	3.7	2.9	6.6	7.9	13.6
1906–7	8.4	4.0	2.9	5.8	2.9	13.5
1905–6	7.4	3.7	2.5	6.3	4.3	10.6
1904–5	9.5	4.4	1.9	8.8	7.8	12.8
Per cent unsatisfactory first term 1903–4[1]	20.2	14.0	11.8	13.4	13.4	24.6

[1] The last year before the formation of the approved list. This year the colleges reported those whose preparation was unsatisfactory. In subsequent years they reported those who failed during the first term. This may account for a part of the difference, but not for a large part.

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This table also shows that the per cent of failures among students in mathematics greatly exceeds that in each of the other subjects for every year reported. The same difference appears among those entering by examination. It is not, therefore, connected with the certificate system.

The following table made up from the same report compares the results for 1908–9 obtained from the certificate with those obtained by examination:

	Received by examination.	Received on certificate.
English:		
Number admitted	393	1,161
Number who failed during first term	35	85
Per cent of those admitted who failed	8.9	7.3
Latin:		
Number admitted	259	960
Number who failed during first term	11	33
Per cent of those admitted who failed	4.2	3.4
Greek:		
Number admitted	43	275
Number who failed during first term	1	4
Per cent of those admitted who failed	2.3	1.5
French:		
Number admitted	326	846
Number who failed during first term	34	39
Per cent of those admitted who failed	10.4	4.6
German:		
Number admitted	174	621
Number who failed during first term	6	39
Per cent of those admitted who failed	3.4	6.3
Mathematics:		
Number admitted	436	1,104
Number who failed during first term	84	136
Per cent of those admitted who failed	19.3	12.3

In every subject except German the results are in favor of admission by certificate. In 1907–8 the per cents in German were 10.1 on examination and 7.9 by certificate. In either method the mathematical subjects fare the worst. In comparing the two systems, it should be borne in mind that in these colleges the large majority of the best students are admitted on certificate and for the most part only those who are unable to obtain certificates present themselves for an examination.

Some friends of the certificate system have been disappointed by one result of the administration of the system by the New England board. They hoped to be able to obtain the benefit of the individual judgment of the principals in the case of men who, under the examination system, might fail to pass the set examinations, but who might be able to take up college work successfully. In this they have been grievously disappointed. The principals almost invariably establish a standing which entitles the recipient to a certificate. If the number reported as failing after entering college brings a warning from the board, the principal simply raises the per cent required for the certificate. The certificate has therefore become a prize for good scholarship, which entitles the successful ones to exemption from col-

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lege examinations. The effect of this is that an increasing number of doubtful men appear at the examination and the examiner receives no aid from the principal in determining whether or not to admit them.

The figures are as follows:

	Examined.	Certified.	Received.	Per cent of whole examined.
English:				
1904-5	239	829	1,068	22.4
1908-9	393	1,161	1,554	25.3
Latin:				
1904-5	184	711	895	20.6
1908-9	259	960	1,219	21.2
Greek:				
1904-5	71	309	380	18.6
1908-9	43	275	318	13.5
French:				
1904-5	155	590	745	20.8
1908-9	326	846	1,172	27.8
German:				
1904-5	70	370	440	15.9
1908-9	174	621	795	21.9
Mathematics:				
1904-5	237	819	1,056	22.4
1908-9	436	1,104	1,540	28.3

Of the two methods of administering the certificate system as practiced in the East and in the West, each appears to be best adapted to the region where it is used. Each has been of great benefit to the secondary school. In the East, the board has been of great benefit in raising the standards, since the school boards seem anxious that their schools shall have the certificate privilege. The curricula are therefore broadened and greater care is taken to obtain competent teachers.

SUBCOMMITTEE 6. STATE AND LOCAL EXAMINATIONS OF TEACHERS.

Although the circulars sent out to the different States brought in a great deal of information pertaining to teachers' certificates and examinations, this information is, so much of it, indefinite that it is impossible to present it in statistical form.

Almost all States hold examinations for teachers, either through the State departments or through the accredited normals of the States. The majority of the States recognize college or university diplomas from other States when the applicants present proper credentials of

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experience. Many of the States issue temporary certificates on these recommendations. In some States a certain amount of professional work and experience is rewarded by a permanent certificate. Some of these certificates are for life or during good behavior, while others are permanent only while the teacher retains the position for which the certificate was granted.

The examining board varies. For State certificates, this board is usually appointed by the State superintendent of public instruction, and it has the privilege of appointing assistant examiners. The county superintendents or local commissioners are responsible for the grading.

In Massachusetts the certificates are all local. The State department has nothing to do with the examinations.

In Connecticut a State examination may be held in any town upon the request of the town school officers. The manuscripts are examined and the certificates issued by the State department.

In the State of New York the elementary certificates are issued by local school commissioners. The secondary certificates are issued by city superintendents and the higher grades by the State commissioner of education.

Iowa and a number of the other States have a system of examinations very similar to that of Indiana. Questions made by the State board of education are sent to the county superintendents who hold examinations in the counties. The examination manuscripts are sent sealed to the State department where they are passed upon by a board of examiners. The certificates issued by the State department are valid in any part of the State. In Colorado the superintendent of public instruction, who by the way is a woman, makes all the examination questions unassisted.

Three-fourths of the States issue first, second, third, and fourth grade certificates. Added to these often are temporary or trial, professional, and life certificates.

In Maine the rank of certificates is determined by examination grades. Usually scholastic and professional attainments are determining factors.

The first grade certificates in the various States range from five to ten years; the second, three to five years; the third, one to two; the fourth is usually a trial or one-term certificate. Few States advance teachers without examinations in professional studies or credits in the pedagogical courses of accredited normal schools and universities.

Exemptions from examination are based more on scholastic and professional attainments than on teaching experience. Nearly every State exempts the graduates of its best universities and colleges. Nearly every State gives a trial to applicants holding degrees from

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the best colleges and universities of other States, and after the experience test, admits these teachers to the exemption privileges of its own graduates.

Pennsylvania exempts college graduates with three years' experience. New Jersey exempts graduates of State normal schools after they have finished a certain amount of postgraduate work.

Wisconsin exempts graduates of its State institutions; Utah, college graduates with two years' experience; Montana, college or normal graduates with from two to five years' successful experience are generally granted certificates, without examination, good for six years.

The school law of Arkansas forbids the issuance of certificates or licenses to teach based upon licenses or diplomas from other States.

In North Dakota graduates from reputable colleges and normal schools receive certificates without examination, and teachers who are not graduates, but who hold first or second grade county certificates, may have these same certificates renewed in case they do the work prescribed by the teachers' reading circle board for a period of two years successfully, or if they attend summer schools.

Wyoming has no uniform examinations for elementary or secondary schools. The local boards apply any requirement they may decide upon.

In the largest cities of the different States there is a great variety of standards, but few city boards accept State certificates. The city superintendent, assisted by several appointed assistants, constitute an examining board. In Boston promotional examinations are held twice per year and a teacher who fails to pass these tests twice consecutively loses her position. These examinations consist of three parts: (1) Success in school during the previous year; (2) professional study; (3) academic study in some one line.

The superintendent of the Grand Rapids, Mich., schools, says: "I find I can secure graduates of normal schools for vacancies in our schools, and consequently the examination of teachers who are not eligible has become almost unknown."

New York City and Chicago demand a great deal in educational fitness from their teachers and hold city examinations regardless of State certificates.

A small per cent of the States report that examinations in algebra and plane geometry are required of applicants for elementary or grade certificates. At least three-fourths of the States and cities require applicants for high school certificates to pass in algebra, plane and solid geometry, regardless of whether or not mathematics is the subject to be taught. Texas, California, Kansas, and Missouri include trigonometry in the mathematical list.

Few States advance teachers' license grades without additional professional work.

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SUBCOMMITTEE 7. EXAMINATIONS OF ACTUARIES.

Up to the present time the only organization that has conducted examinations for actuaries in the United States is the Actuarial Society of America. This society, as its name implies, does not confine its activities to the United States. A large and influential percentage of its membership is in Canada, where, too, it holds examinations. The Institute of Actuaries of Great Britain also conducts examinations in Canada, but they no doubt will be considered in the report from England.

The Actuarial Society of America was founded in 1889, but prior to 1897 did not require the passing of examinations for admission. It limited its membership to those in high actuarial positions and who were known to have thorough qualifications. Since 1897 admission without examination has not been absolutely abolished, but restrictions have been so thrown about such admission that up to the present only a few distinguished foreigners and a bare half dozen actuaries from this continent have been so admitted. All of the half dozen of this continent are men who had attained a standing in the actuarial world before the examination system was established and were in responsible positions at the time of admission.

In a certain sense the examinations of the Actuarial Society may be compared with those for admission to the bar, in the fact that the passing of them stamps the man as technically qualified to be a member of the profession. In another sense they are entirely different in that legally the examination of the Actuarial Society has no effect, since a person, whether he be a member of the society or a dry-goods clerk, has the legal right to call himself an actuary. The Actuarial Society is not even incorporated.

It might also be added that the passing of the actuarial examinations is not sufficient to make a fully qualified actuary any more than the passing of the bar examinations makes a lawyer fully qualified. In each case practical experience is absolutely necessary.

The examinations of the Actuarial Society are four in number and are divided into two sets of two examinations each. The first two examinations admit to associateship in the society. This is not membership, nor even qualified membership, but entitles persons to the right to attend the meetings and is recognized, both in and out of the society, as showing thorough qualification in certain of the fundamentals of actuarial science and as indicating the younger men who will ultimately pass the examinations and be entitled to the full privileges of the society.

The remaining two of the examinations may be taken by those who have become associates and lead to fellowship in the society, the title by which full membership is known. The attempt is made in

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the examination for "Fellow" to give to a considerable extent a practical turn to questions, so that they will test the candidate's familiarity with and understanding of the practical questions which an actuary meets.

The subjects covered by the examinations are best shown by the syllabus of the society, which is herewith quoted:

SYLLABUS OF EXAMINATIONS.

For Enrollment as Associate.

Section A.

Part I:

1. Arithmetic.
2. Algebra, including—
   a. Permutations and combinations.
   b. Binominal theorem.
   c. Series.
   d. Theory and use of logarithms.
3. The elements of the theory of probabilities.
4. Elementary plane geometry.

Part II:

1. Elements of the calculus of finite differences.
2. Elements of differential and integral calculus.
3. The principles of double entry bookkeeping.
4. Compound interest and annuities certain.

Section B.

Part I:

1. The application of the theory of probabilities to life contingencies.
2. Theory of annuities and assurances, including the theory and use of commutation tables and the computation of premiums.
3. The use of life tables (including application to population statistics) and the construction of monetary tables based thereon.
4. The outlines of the history of life insurance.

Part II:

1. The application of the calculus of finite differences and of the differential and integral calculus to life contingencies.
2. Valuation of policies.
3. The general nature of insurance contracts.

For Admission as Fellow.

Part I:

1. The sources and characteristics of the principal mortality tables.
2. Methods of constructing and graduating mortality tables.
3. Methods of loading premiums to provide for expenses and contingencies.
4. Valuation of the liabilities and assets of life insurance companies.
5. Insurance of under-average lives and extra premiums for special hazards.
6. Practical treatment of cases of alteration or surrender of life insurance contracts.
7. Valuation of life interests and reversions.

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Part II:

1. The assessment of expenses and the distribution of surplus.
2. Life insurance bookkeeping, office practice, preparation of schedules, statements, and reports.
3. The investments of life insurance companies.
4. The principles of banking and finance.
5. Laws of the United States and Canada relating to life insurance.
6. Calculation of premiums for and valuation of pension funds.
7. Method of compiling and graduating sickness, accident, and disability statistics; construction of premiums therefrom.

It should be stated that while the scope and the difficulty of the examinations have been rapidly increasing, the wording of the syllabus has been but little changed except in the addition of a few subjects and the rearrangement of subjects as between the different examinations. In reading the syllabus it should be borne in mind that a broad interpretation is given to the topics, and especially that in the examination for admission to fellowship practically any question which is properly an actuarial question and which does not distinctly belong to the examination for the associates is admissible.

The foundation for actuarial education rests, as is generally recognized, upon the subject of mathematics and especially upon the theory of probabilities. Mathematics, however, is only the foundation, and even a thorough knowledge of the mathematics of actuarial science falls far short of making a competent actuary. An inspection of the topics of the examination for fellowship shows how large a part of the preparation lies entirely outside of the field of mathematics and how important are such subjects as law, finance, investments, and accounting. In certain phases of each of these subjects, particularly law and accounting, actuarial knowledge is necessary to make one competent to advise his company, since questions arise which can not be properly understood or dealt with without such a knowledge of the foundations of life insurance as the actuary alone has. Thus, to a certain extent, the actuary must be a lawyer, a financier, an accountant, and also, last, but not necessarily least, a man with a practical knowledge of affairs.

It is natural to compare the examinations of the Actuarial Society with those of the Institute of Actuaries, which is the older society and has always maintained the highest standard. A few years ago those of the Actuarial Society were much easier than those of the institute. They have, however, gradually become more difficult, until to-day it is the aim of the examiners to place them on a par with those of the older society. The type of question in the two organizations is sometimes quite different. This is due partly to the difference in practice in the two countries and partly to the effort to make the examinations of the society as thoroughly practical as possible.

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One of the reasons why the earlier examinations of the society were easier than those of the institute is that in England the coaching system of preparation with first-class instruction and directions for reading and studying was available to candidates, whereas, in this country until quite recently, there has been no instruction or guidance available for the majority of those coming up for the examinations except as they could get it from their superior officers in the companies by which they were employed, and there were not even satisfactory books to help in the preparation. In more recent years the situation has been much better, both in regard to coaching, if desired, and in regard to books and papers. While the Textbook of the Institute of Actuaries has been for years the standard work and covers a large part of the theoretical work which the student should know, it is written in difficult style, and its chapters and subjects are arranged in logical order rather than in the order to assist the student. Consequently, it is not a book for beginners. About five or six years ago there appeared a well-written elementary textbook (Moir's Primer) covering the foundations and being an introduction to most of the subjects taken up in the Textbook. This bridged the way over many of the difficulties for the beginner. There have also appeared in England certain books which gave great help to the student in the more advanced work, covering some of the parts which he had heretofore to dig out of actuarial papers as best he could, and there have also appeared in the Journal of the Institute of Actuaries and in the Transactions of the Actuarial Society various papers of a character to be of great assistance.

In regard to the practical subjects for the fellowship examinations the situation has not changed much to the advantage of the student, but the demands of the society have nevertheless been made greater, requiring a higher grade of knowledge in these subjects recently than in former years.

We include below a partial list of works on actuarial subjects now in print. Works on law, finance, accounting, administration, and other subjects, with which actuaries must be familiar, are omitted from the list, as they do not have reference to the mathematics of insurance.

BOOKS ON TECHNICAL ACTUARIAL SCIENCE.

Life Assurance Primer, H. Moir. C. C. Hine's Sons, New York.

Practical Lessons in Actuarial Science. Dawson. Spectator Company, New York.

Notes on Life Insurance, E. B. Fackler. Spectator Company, New York.

Institute of Actuaries Textbook:

Part I, R. Todhunter. C. & E. Layton, London.

Part II. G. King. C. & E. Layton, London.

Insurance. T. E. Young. Sir Isaac Pitman & Sons, London.

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Actuarial Science, Graduated Exercises, Ackland and Hardy. C. & E. Layton, London.
Mathematisch-technische Kapitel zur Lebensversicherung, C. Landré. Gustav Fischer, Jena.
Die Lehre von der Mortalität und Morbilität, Westergaard. Gustav Fischer. Jena.
Die Mathematischen Rechnungen bei Lebens- und Rentenversicherungen, A. Zillmer.
Théorie des assurances sur la vie, H. Poterin du Motel. L. Warnier et Dulac, Paris.
Théorie et pratique des assurances sur la vie, H. Laurent.
Actuarial Theory, Robertson & Ross. Spectator Company, New York.
Theory of the Construction of the Tables of Mortality, G. F. Hardy. C. & E. Layton, London.
Annuities and Reversionary Payments, 2 vols., Jones. Baldwin, London.
Annuities, Treatise on, with Tables. Davies. C. & E. Layton, London.
Theory of Finance, G. King. C. & E. Layton, London.
Journal of the Institute of Actuaries, vol. 1–42.
Transactions of the Actuarial Society of Edinburgh.
Transactions of the Faculty of Actuaries.
Transactions of the Actuarial Society of America.
Proceedings of the International Congress of Actuaries. (Separate sets for each of the six congresses.)
Encyclopädia der mathematischen Wissenschaften; Article Lebensversicherungs Mathematik, G. Bohlmann.
British Offices Life Tables; Account of the Principles and Methods adopted in the compilation of the data, the Graduation of the Experience, and the Construction of the Deduced Tables. C. & E. Layton, London.
Bulletin de l'Association des Actuaires Belges.
Bulletin Trimestriel de l'Institut des Actuaires Français.

SPECIMEN EXAMINATION QUESTIONS.

Below are given a number of typical problems for each of the four examinations. These are all taken from the examination questions of years subsequent to 1906, as these later years give the best representations of the examinations as they now are. There are also attached to this report copies of the last three pamphlets giving in full the examinations of the Actuarial Society for 1907, 1908, and 1909, and certain other information with regard to the society, including lists of fellows and associates.

Section A.—Associate.

Part I.

1. An army column 10 miles long is moving forward at a uniform rate. An aid rides from rear to the head of the column and back to the rear at a uniform rate. When he reaches the rear it is where the head was when he started. How far did he ride?
2. (*a*) Expand to four terms $(9-6x)^{-\frac{3}{2}}$
   (*b*) Write in its simplest form the coefficient of x^9 in $(2+\frac{3}{2}x)^{17}$.
   (*c*) Is the binomial expansion always correct for negative and fractional exponents? Discuss briefly.

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3. (*a*) Five men toss a coin in order until one wins by tossing head. What is the probability that neither the second or third man will eventually win?

(*b*) A coin is drawn at random from a purse known to contain either silver or gold coins, nine in all, and proves to be a silver one. What is the probability that at least seven of the coins were silver before the drawing took place?

4. (*a*) There are two sets of counters, each set numbered from 1 to 8, inclusive. In how many ways can four counters be chosen so that none of them will be duplicates?

(*b*) In how many different ways may 20 recruits be drafted into five regiments, four to each; and in how many different ways may 15 oranges be divided into 3 equal groups?

Part II.

1. (*a*) Show that the mth difference of an integral function of n of the rth degree is an integral function of the $(r-m)$th degree if $m<r$, a constant if $m=r$, zero, if $m>r$.

(*b*) Having given the following net premiums, find by interpolation the net premium for a 31-year endowment at age 34.

Age.	Endowment—		
	25 years.	30 years.	35 years.
30	32.376	26.748	23.113
33	32.807	27.327	23.880
36	33.406	28.130	24.[illegible]27

2. A loan of $100,000 bearing interest at 5 per cent is to have the principal repayable as follows:

$1,000 at the end of 5 years,
1,250 at the end of 6 years,
1,500 at the end of 7 years, etc.

What price must be paid for the loan so that the purchaser may realize 6 per cent on his investment?

Given $V^5=.7473$ $V^{25}=.2330$ at 6 per cent.

3. A loan of $15,000 is to be repaid by monthly payments of $100, which include interest on principal outstanding at the rate of 6 per cent per annum compounded monthly. How many monthly payments would be made?

Given log 2=.3010300: log 3=.4771213: log 67=1.8260748.

4. A company starts business October 1 with $150,000 capital stock, paid in cash; $100,500 is immediately invested in 4 per cent bonds (interest payable semiannually) at 100 and accrued interest for 1½ months. During the three months the company collects $35,000 in annual premiums, pays $27,000 for commissions and other expenses, and has no death claims. On December 31 the reserve and other liabilities are computed at $20,000. Indicate the entries to be made on the ledger and give a statement of financial condition December 31, so far as obtainable from the data given.

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Section B.

Part I:

1. Derive the formula for the net annual premium for a continuous installment endowment which provides that at maturity (at end of endowment period or by death) 5 per cent of the face shall be paid each year for 20 years and that these payments shall continue as long beyond the 20 years certain as either the assured or the beneficiary survive.
2. Prove that

$$(a)\ n\,\mathrm{V}\,x:\overline{m}|=dx+n:\overline{m-n}|(\mathrm{P}x+n:\overline{m-n}|-\mathrm{P}\,x\,\overline{m}|)$$

$$(b)\ n:m\,\mathrm{V}\,x=n\,\mathrm{V}\,x+\mathrm{A}\,x\,(n\,\mathrm{V}\,x:\overline{m}|-n\,\mathrm{V}\,x)$$

$$(c)\ t\,\mathrm{P}\,x:\overline{m}|=\frac{t\,\mathrm{P}\,x\,.\,\mathrm{P}\,x:\overline{m}|}{\mathrm{P}\,x:\overline{m}|+d}\left(1+\frac{d}{\mathrm{P}x}\right)$$

and give a verbal interpretation of any one.

Part II:

1. (*a*) Explain select and ultimate reserves.
   (*b*) Compare the select and ultimate method with preliminary term.
   (*c*) How can the present value of expected mortality saving be easily obtained from select and ultimate tables?
   (*d*) What is the formula for a forborne temporary annuity? Name one or two important uses of forborne annuities.
2. Describe briefly the origin and peculiar features of the following mortality tables, and state for what purposes, if any, each has been or may be used:
   (*a*) Farr's healthy districts.
   (*b*) 30 American offices.
   (*c*) O^M.
   (*d*) McClintock's.

Part I. Fellow.

1. (*a*) What methods were adopted in the construction of the British offices life tables, 1893, for the elimination of duplicate lives, in the case of aggregate and select tables, respectively?
   (*b*) Among a body of lives selected five years ago, how could you determine theoretically how many damaged lives would be included among the survivors? Discuss whether this calculation could be used reliably for any practical purpose.
2. (*a*) Why is it necessary to graduate mortality tables?
   (*b*) What are the tests of a good graduation?
   (*c*) Outline briefly the methods adopted in the graduation of the O^M, $O^{M(5)}$, and $O[^M]$ tables.
3. (*a*) State four different methods of valuing for an annual report the marketable securities of an insurance company.
   (*b*) Which would you choose, and why? (Be explicit in showing why the method you choose is the proper one.)
4. (*a*) Describe the method which you consider the best for granting insurances on under-average lives, distinguishing risks that are under-average on account of family or personal history and on account of occupation.
   Mention any statistics with which you are acquainted which would be useful in rating substandard risks.

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(*b*) Specify how you would treat the following cases in granting policies:

(1) Army officer, age 30; age 50.

(2) Bartender, age 30.

(3) Bookkeeper, age 30. Mother died at age 25 of consumption; father alive at age 65; no brothers or sisters; 20 per cent underweight.

(4) Application for large amount (company's limit) on capitalist, age 60; 25 per cent overweight. Mother died age 30, consumption; father died age 60, Bright's disease.

Part II.

1. (*a*) Explain fully how you would assess expenses for the purpose of distribution of surplus:

(1) As between new and renewal business.

(2) As between life and endowment policies.

(*b*) In distributing profits from mortality would you distinguish between various plans of assurance?

(*c*) On what basis would you allot to participating policy holders profits derived from nonparticipating insurance and annuity business?

In each case state your reasons fully.

2. (*a*) Describe clearly and briefly the economic functions of a stock exchange

(*b*) Describe the workings of a clearing house. Does a clearing house effect any important economic saving, or is it merely a convenience to the members and a means of saving clerk hire and wages of messengers?

(*c*) Give a satisfactory reason that a more or less serious crisis should occur about every 10 years.

3. State in tabular form and without discussion the most important advantages and disadvantages of each of the following classes of securities as an investment for life companies, supposing no legal limitations to investments. Indicate which you would reject entirely and which you consider doubtful:

(1) City mortgages.

(2) Suburban mortgages.

(3) Farm mortgages.

(4) Railroad stocks.

(5) Railroad bonds.

(6) City gas stocks.

(7) Telephone stocks and bonds.

(8) Street-railway stocks and bonds.

(9) Interurban electric-railroad bonds.

4. (*a*) State fully the provisions of the New York law as to limitation of expenses. Do these provisions apply in all respects to every life insurance company doing business in New York State? If not, to what cases and in what respects do they not apply? What amendments to this section of the New York law would you propose, and why?

(*b*) In what respects does the Wisconsin law differ from that of New York in regard to limitation of expenses?

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INDEX.

Actuarial science, list of books, 66–67.
Actuarial society of America, 63; specimen examination questions, 67–70; syllabus of examinations, 64–65.
Actuaries, examinations, 63–70.
Algebra, examinations, 32, 34–35, 38–39, 43, 44–47; specimen examination papers, 23–26; study, 19–20.
Amherst college, and college entrance board, 32; mathematics, entrance requirements, 15.
Arithmetic, examinations, 43–44.
Arkansas, teachers' certificates, 62.
Boston, promotional examinations, 62.
Boston university, and college entrance board, 32.
Bowdoin college, and college entrance board, 32; mathematics, entrance requirements, 14.
Brown college, and college entrance board, 32.
Butler, N. M., on college entrance board examinations, 31.
California, University of, establishment of certificate system, 54.
Carnegie foundation for the advancement of teaching, 7; and college entrance board, 23.
Certificates, high school, and entrance to college, 50–60; teachers, 60–62.
See also under names of States.
College admission examinations. *See* College entrance examinations.
College entrance board, attitude of preparatory schools, 32; attitude of the colleges, 32–33; benefit to secondary schools, 9; cooperative efforts, 9; examination papers, 29–30; examiners, 28; finances, 33; history, 28; method of reading and grading papers, 31–32; plan of preparing papers, 30–31; specimen examination questions, 34–39; statistics, 33–34.
College entrance examinations, 7–8; argument for retention, 17–19; mathematics, 14–16; recommendations as to improvements, 19–21; specimen papers, 22–27; papers, 21–27.
See also under names of colleges and universities.
Colleges, entrance to, by certification, 50–60.
Colleges and universities, entrance by State examinations, 40–50; entrance examinations, 7–8; system of entrance by school certificates, 16.
Colorado, teachers' certificates, 61.
Columbia university, mathematics, entrance requirements, 15–16.
Connecticut, teachers' certificates, 61.
Cornell university, mathematics, entrance requirements, 15.
Dartmouth college, and college entrance board, 32.
Elementary schools, mathematics, nature of promotion, 10–14; written examinations, 12–14.
Examinations, actuaries, 63–70; mathematics, New York State education department, 40–50, specimen papers, 43–50; proportion of children required to take; specimen, American colleges, 22–27; State, for colleges and universities, 40–50; teachers, State and local, 60–62; written, elementary schools, 12–14.
See also College entrance examinations.
Frieze, President, on admission of students to college by certification, 50–52.
Geometry, examinations, 32, 36–38, 43, 47–49; specimen examination papers, 22, 25, 27; study, 20–21.

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Graduation, requirements, secondary schools, 8.
Harvard university, and college entrance board, 33; mathematics, entrance requirements, 14–15; specimen examination papers, mathematics, 22–24.
High schools, entrance to college by certification, 50–60; New York State, examinations, 8.
Iowa, teachers' certificates, 61.
Logarithms, specimen examination paper, 23.
Maine, teachers' certificates, 61.
Massachusetts, teachers' certificates, 61.
Massachusetts institute of technology, and college entrance board, 33; mathematics, entrance requirements, 16.
Michigan, University of, admission of students on certificate, 53.
Montana, teachers' certificates, 62.
New Jersey, teachers' certificates, 62.
New York (State), admission to public high schools, 8; education department, examinations, 40–50; specimen examination questions, 43–50; teachers' certificates, 61.
New York, University of the State of, regents' examinations, 40–43.
North Carolina, University of, mathematics, entrance requirements, 14–15.
North central association of colleges and secondary schools, 52.
North Dakota, teachers' certificates, 62.
Oberlin college, mathematics, entrance requirements, 15.
Pennsylvania, teachers' certificates, 62.
Pennsylvania, University of, mathematics, entrance requirements, 14–16.
Preparatory schools, entrance to college by certification, 50.
Princeton university, mathematics, entrance requirements, 14–16; specimen examination papers, mathematics, 26–27.
Promotional examinations, Boston, 62.
Promotions, elementary schools, mathematics, 10–14.
School certificates, entrance to college by, 16.
Secondary schools, benefits derived from College entrance examination board, 9; requirements for graduation, 8.
See also High schools.
Sheffield scientific school, and college entrance board, 32; specimen examination papers, mathematics, 24–25.
South Carolina, University of, mathematics, entrance requirements, 15.
Teachers, certificates. *See* Certificates, teachers.
Teachers, State and local examinations, 60–62.
Trigonometry, examinations, 39, 43, 49–50; specimen examination paper, 23, 27.
United States military academy, mathematics, entrance requirements, 14.
University of Maine, and college entrance board, 32.
Utah, teachers' certificates, 62.
Vermont, University of, mathematics, entrance requirements, 14–15.
Waterville, University of, mathematics, entrance requirements, 15.
Wesleyan college, and college entrance board, 32.
Whitney, Professor, on the problem of harmonizing State inspection by numerous colleges, 53.
Williams college, and college entrance board, 32.
Wisconsin, teachers' certificates, 62.
Worcester polytechnic institute, and college entrance board, 32.
Wyoming, teachers' certificates, 62.
Yale university, mathematics, entrance requirements, 14–15; specimen examination papers, mathematics, 25.
See also Sheffield scientific school.

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MATHEMATICS IN THE TECHNOLOGICAL SCHOOLS OF COLLEGIATE GRADE IN THE UNITED STATES

INTERNATIONAL COMMISSION ON THE TEACHING OF MATHEMATICS

THE AMERICAN REPORT

COMMITTEE No. IX

WASHINGTON
GOVERNMENT PRINTING OFFICE
1911

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THE AMERICAN REPORT.

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CONTENTS

	Page.
I. Introduction.—Place of applied science in higher education in the United States	5
Definitions	5
Historical sketch	6
Present general conditions	8
II. Plan of investigation	10
Questionnaire on the teaching of mathematics in universities, colleges, and technological schools or departments	11
III. Review of reports of subcommittees on independent technological schools and on technological departments of colleges and universities	13
Organization and status of mathematical staff	13
Entrance requirements in mathematics	14
Mathematical curriculum	16
Correlation of mathematics with technological subjects	18
Unification of the mathematical curriculum	21
Aims and methods of teaching—Examinations	23
Preparation and qualifications of teachers	24
IV. Conclusion	25
Subcommittee 1.—Independent technological schools	26
Organization	26
Mathematical curriculum	28
Aims and methods of teaching—Examinations	30
Preparation of teachers	32
The agricultural and mechanical colleges	33
Subcommittee 2.—Technological departments of colleges and universities	34
Introduction	34
Organization of departments	34
Entrance requirements	35
Mathematical curriculum	36
Correlation of departments	36
Unification of the curriculum	37
Correlation of mathematics and technology	37
Attitude of departments of technology	37
Methods of instruction	38
Aim and results of instruction	38
Preparation of teachers	39
Supplement on special methods of instruction	40
The two-hour system at Harvard	40
Redirection of educational aims	41
The cooperative system at the University of Cincinnati	41
Effect of the cooperative system on mathematical instruction	42
Conclusion	43

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MATHEMATICS IN THE TECHNOLOGICAL[1] SCHOOLS OF COLLEGIATE GRADE.

I. INTRODUCTION.—PLACE OF APPLIED SCIENCE IN HIGHER EDUCATION IN THE UNITED STATES.

DEFINITIONS.

The most striking characteristic of technological as of other forms of education in the United States from the international standpoint is doubtless its extreme range of variation and the impossibility of framing general statements and definitions which shall be free from numerous exceptions. For the purposes of the present report a technological school or department may be defined as one giving systematic instruction in engineering and other forms of applied science to students entering the institution at the average age of 18 or 19, usually on the completion of a high-school course four years in length. This definition would exclude, for example, the lower-grade technical schools which admit younger students with less preparation, and which give the training necessary for minor industrial positions, with little or no use of the calculus; it would exclude, again, the evening schools for the supplementary training of men engaged in technical vocations. Neither of these important types is, however, as yet very much developed in the United States in comparison with the technological institutions of collegiate grade which are here discussed. It should be noted, however, that actual technological instruction is often preceded in the higher institutions, either from choice or requirement, by one or more years devoted to academic or general scientific studies; also that a considerable and increasing number of the technological students have previously completed a college course. The technological instruction aims to qualify its graduates both for immediate usefulness in junior positions in the various branches of engineering, in technical chemistry, in archi-

[1] There is some diversity of usage in regard to the use of the words "technology" and "technological." These terms, employed in the reports of the Bureau of Education and adopted by the commissioners in their general scheme, correspond with the titles of the various "schools" and "institutes" of technology, and are here used as nearly equivalent in meaning with "applied science" and "engineering," being, however, somewhat more definite and restricted in scope than the first and somewhat more comprehensive than the second. They seem to the writer to have for the present purpose the important advantage of comparative freedom from the vagueness or ambiguity which necessarily attaches to such words as engineering, technical, etc., which are in more general colloquial use. H. W. T.

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tecture, and for ultimate professional responsibility proportionate to individual capacity, etc. The curriculum is usually four years in length (with a present tendency to extension), and students completing it commonly receive the degree bachelor of science (B. S.), with specification of the professional department. If the same institution gives also academic courses leading to the bachelor of arts degree, it is in general deemed, in what follows, to be a college or university having a technological department. The boundary can not, however, be very sharply drawn, and in some of the universities the technological department preponderates numerically.

HISTORICAL SKETCH.

Prior to the Civil War of 1861–1865 technological or engineering education in the United States was represented chiefly by the Rensselaer Polytechnic Institute at Troy, N. Y., founded in 1824; by the work of Union College in civil engineering; by the more recently established scientific schools of Harvard and Yale Universities; and in a special sense by the military and naval academies at West Point and Annapolis. July 2, 1862, a far-reaching act of Congress provided a national grant of public land to each State for the—

> endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts.

Some of these grants proved enormously productive, and subsequent acts have largely increased the resources of the institutions.

The rapid subsequent growth of technological education has been due not only to this legislation, but to the economic conditions of the times. The close of the Civil War was succeeded by a period of extraordinary industrial development, particularly in the building of railroads, but also in manufacturing and mining. The natural resources of the country were so abundant, the demand for immediate results so keen, the supply of trained engineers so scanty, that quick and wasteful methods were inevitable. The existing institutions and the methods of apprenticeship could no longer furnish a sufficient number of engineering recruits. Engineering had to be taught to large bodies of students by men apt to be inexperienced either in engineering or in teaching, sometimes even in both. The constantly expanding subject-matter had to be worked into teachable form by teaching it. Professional employment was so easily obtained that many students were unable to resist the temptation to curtail their preparation for it. Yet, on the other hand, there was widespread distrust of engineering education in its newer forms. Manufacturers accustomed to get on by rule-of-thumb methods were slow to realize the need of employing mechanical engineers and chemists. Educa-

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tors trained in the classical tradition denied the educational value of utilitarian studies. Thus technological education during the past half century has had to work out its difficult problems sometimes in independent institutions, sometimes in connection with colleges and universities with, for a time at least, a conservative lack of sympathy for applied science. This relationship has greatly influenced the development both of technological education and of the colleges and universities which have undertaken it. At the present time, while its unsolved problems are numerous and pressing, its honorable status is established, and a great host of graduates are eagerly absorbed each year by the industries of the nation.

The fundamental subjects for technological students have naturally been mathematics, physics, and chemistry. Of these physics and chemistry had not been much developed in the older colleges, while a moderate range of mathematics had been widely employed as a means of mental discipline without much emphasis on its applications. The early students of engineering were naturally taught mathematics like their fellow collegians and by teachers of the same type. It was necessary for them, however, to attain some facility of mathematical technique; their time was limited, their appreciation of theoretical discussion not keen. The teachers of engineering, with vague recollections of their own collegiate mathematics (too often studied without reference to its applications), were apt to be successful in avoiding the use of anything beyond trigonometry, and thus confirmed the students in a willing belief in the relative uselessness of analytic geometry and the calculus to practical men. Out of these conditions have grown severe and sometimes exaggerated criticisms of mathematics and mathematicians, coupled with a tendency to insist that mathematics shall be taught merely as a "tool" and that the teaching shall be done by men of engineering training and experience.[1] There are indications of progress toward a better mutual understanding among the parties to this controversy. Recent active discussion will assuredly result in a better understanding and in progressive improvement.

The extraordinary development of applied science, the continual specialization of the engineering professions, the immense advances in the fundamental sciences, physics and chemistry, the necessity for turning out better and more broadly trained men, have in recent years caused severe congestion of the technological curriculum. This has been alleviated in some measure by condensation of subject matter, by time-saving methods of teaching, by utilization of the summer vacation for educational purposes, by concentration of attention on general principles at the expense of technical processes.

[1] Compare Symposium of Mathematics for Engineering Students, reprinted from Science, of July-September, 1908.

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Nevertheless, it has often been found necessary to restrict the time assigned even to mathematics to very narrow limits, and there is a marked tendency among the stronger institutions to make the normal length of the course five years, or even six. The efforts to economize time have led, with other causes, to a critical revision of the traditional mathematical program, of which a fuller statement will be found below. These changes, while supported by a considerable body of expert opinion, are naturally still in the experimental stage. The fact that each higher institution in the United States has the full control of its own curriculum, with no attempt at standardization on the part of Nation or State, is naturally most favorable to the working out of such experiments.[1] Excesses in any direction are, on the other hand, likely to be checked by the inter-relations of the institutions and by the usually conservative influence of the larger and older among them.

PRESENT GENERAL CONDITIONS.

The Report of the United States Commissioner of Education for 1908 shows that of 101,000 collegiate students reported nearly 31,000 were taking engineering courses, 6,000 agriculture, and 12,000 general science. Of 120 universities, colleges, and technological schools included in the report as giving engineering instruction about one-third are wholly technological (or agricultural), and these have about three-eighths of the total number of engineering students.

The United States fosters technological education by considerable annual grants, amounting in 1907–8 to about $2,500,000, not including grants for the Military and Naval Academies. The control and management of the institutions are vested, however, in State (not national) officers, or in corporations which are sometimes wholly private, and sometimes include representatives of the State.

The relation of the several States to higher education varies widely. In the older eastern States instruction of collegiate grade is mainly carried on by great private institutions, some of which have received vast endowments from private sources. In the rest of the country, and particularly in the Middle West, the great State universities are liberally supported from the State treasuries. The national grants have in many cases been assigned by the States to the State universities; in some, however, to separate institutions.

The fundamental difference between the ordinary college (or the academic department) and the technological school or department consists in the definite professional aim of the latter. Here again there is a wide range from the technological school which confines

[1] In recent years certain private agencies, notably the Carnegie Foundation for the Advancement of Teaching, have come to exert a considerable influence in favor of relatively high standards by establishing conditions of eligibility for institutions deserving financial support.

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its attention to technical subjects and those on which they directly depend, to the university which insists on two or more years of general college work as a preliminary to the professional. The independent agricultural and mechanical colleges have often maintained somewhat lower standards of admission and graduation.

While most universities and colleges leave their students at present a considerable freedom of choice of subjects, the engineering curriculum is generally laid out with relatively complete definiteness. During the first year or two the curriculum may be identical for all; thereafter the student follows the program he has selected, with perhaps some latitude in respect to the choice among collateral subjects or professional specialties.

The influence of university connection on technological education has various interesting aspects. When academic and technological departments are not very unequal in size and age, and when other conditions are favorable, each may react advantageously on the other. The development of work in applied science has greatly stimulated interest in the sciences themselves and in laboratory methods of instruction. University connection has in many cases insured a larger and stronger staff, a better library, a more favorable position for science departments, and a broader educational spirit and policy. In the larger technological schools many of these advantages have also been realized, together with somewhat greater freedom of development.

On the other hand there is danger that in a university the balance may not always be evenly held between the interests of the academic and the technological students, or there may be an excess of emphasis on abstract science, or the professional spirit of the technological student may suffer impairment from the distractions of academic athletics, etc.

An interesting review of present conditions, and particularly of current criticism of the teaching of mathematics to students of engineering, may be found in the reports of the joint meeting of the sections on mathematics and on mechanical science and engineering of the American Association for the Advancement of Science and the Chicago section of the American Mathematical Society, reprinted from Science of July 17, 24, 31, August 7, 28, and September 4, 1908, and referred to in the following pages as the Chicago symposium. Reference will also be made to a symposium on instruction in calculus at the Madison (1910) meeting of the Society for the Promotion of Engineering Education, of which, however, only a preliminary publication is yet available.

A committee appointed at the Chicago meeting to report to the Society for the Promotion of Engineering Education has courteously placed material collected by it at the disposal of the present commit-

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tee. The scope of its work is indicated by the following preface of its report (which is to be published in the bulletin of the society):

The object of this report is to present a synopsis of those fundamental principles and methods of mathematics which, in the opinion of the committee, should constitute the minimum mathematical equipment of the student of engineering.

It is hoped that this report may be serviceable in two ways: First, to the teacher, as an indication of where the emphasis should be laid; and secondly, to the student, as a syllabus of facts and methods which are to be his working tools. It does not include data for which the student would properly refer to an engineer's handbook; it includes rather just those things for which he ought never to be obliged to refer to any book, the things which he should have constantly at his fingers' ends.

The teacher of mathematics should see to it that at least these facts are perfectly familiar to all his students, so that the professor of engineering may presuppose, with confidence, at least this much mathematical knowledge on the part of his students. On the other hand, if the professor of engineering needs to use, at any point, more advanced mathematical methods than those here mentioned, he should be careful to explain them to his class.

The defects in the mathematical training of the student of engineering appear to be largely in knowledge and grasp of fundamental principles, and the constant effort of the teacher should be to ground the student thoroughly in these fundamentals, which are too often lost sight of in a mass of details.

The committee has not found it possible to propose a detailed course of study. The order in which these topics should be taken up must be left largely to the discretion of the individual teacher. The committee is firmly of the opinion, however, that whatever order is adopted, the principal part of the course should be problems worked by the students, and that all these problems should be solved on the basis of a small number of fundamental principles and methods, such as are here suggested.

What is most needed at the present time is a series of synoptical textbooks, which shall present, in compact form, first, the fundamental principles of the science, and second, a classified and graded collection of problems (which would naturally be subject to continual change and expansion). It is the hope of the committee that this report, which is confined to the first part of the desired textbook, will stimulate throughout the country practical contributions toward the second.

II. PLAN OF INVESTIGATION.

A detailed questionnaire (reprinted below), prepared by the present committee in cooperation with that on colleges of liberal arts and universities, State and endowed, was issued by the United States Commissioner of Education in December, 1909, to a large number of institutions believed to be representative. The accompanying reports of subcommittees, one on technological schools, the other on technological departments, are based largely on a comparative study of the replies received. No attempt has been made, however, to secure statistical completeness. The remainder of the present report consists mainly of a review of the subcommittee reports with some comparative discussion of the facts and conditions brought out in them.

The committee tenders its grateful thanks to the Commissioner of Education for his valued aid, and to the fellow mathematicians to

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whose painstaking and suggestive replies these reports owe much of whatever value they may possess. Special mention should also be made of the cooperation of Professors A. Ziwet, of the University of Michigan and E. R. Hedrick, of the University of Missouri.

Questionnaire on the Teaching of Mathematics in Universities, Colleges, and Technological Schools or Departments.

General Information.

1. Name of institution. Place.

2. Mathematical staff (complete list with present titles, academic degrees, and a brief mention of any special preparation of members, e. g., training in physics, astronomy, or technology, or engineering practice).

ORGANIZATION.

3. List of departments (schools, colleges, etc.) in which mathematics of collegiate grade is taught.

4. List of degrees given in these departments for undergraduate work.

5. In these different schools or departments are there separate mathematical departments? If not, what combinations are made? What relations subsist between different mathematical departments? (Compare with question 2.)

6. Status of mathematical department in its relations—dependence or independence—to the general faculty or to other coordinate departments.

7. Status of mathematical teachers as to internal organization of mathematical department; influence or control exercised by senior teachers or head of department over junior colleagues.

8. To what extent are members of the department restricted or directed by administrative officers in the conduct of their instruction, either as to subject matter or methods?

9. What principles govern distribution of teaching? For example: Do senior teachers give a large or small proportion of elementary or required instruction, and are advanced elective subjects intrusted to junior teachers?

10. Are department meetings held regularly for discussion of current teaching, or scientific matters, or both?

11. To what extent are collegiate and technological students taught in the same classes, and what are the reasons for or against such combinations? (Compare 26.)

12. To what extent are mechanics and descriptive geometry or other branches of applied mathematics taught by the mathematical department?

13. By what system or method are vacancies in the mathematical staff filled?

14. What material changes, if any, in matters referred to in questions 1 to 13 have been made during the past 10 years?

15. What tendencies to change are now in operation, and what changes seem to you desirable?

CURRICULUM.

16. Extent of admission requirement. (Preferably in terms of the definitions recommended by committee of American Mathematical Society and now in use by the College Entrance Examination Board. In case of deviation from these, a brief statement of reasons is desired.) Samples of examination papers or certificate blanks are requested. Age of students at entrance?

17. General quality of mathematical preparation as indicated by the results of your admission system? A brief discussion of prevalent defects in preparation is invited.

18. What changes of admission requirements in mathematics have been made during the past 10 years, and what changes are still desirable?

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19. Outline of mathematics curriculum, with brief statement of conditions which have determined it, and of any existing tendencies to change it. It is desired that time and number of exercises allotted to each subject be shown, that textbooks in use be mentioned, and any deviation from usual selection or order of topics be stated, with reasons. The extent to which subjects ordinarily separate are combined is of particular interest. Status of mathematics, as required or elective subject, as a major or minor subject, as requirement for degrees, or for recommendation for secondary teaching.

20. What mathematical courses are required or elective in advance of the (first) course in calculus? Does an extension of this list either as to required or elective subjects seem to you desirable and probable for technological students? Do you favor, for example, mathematical requirements equal to those of the continental technological institutions?

21. To what extent is the curriculum determined either as to content or aim by the needs of other departments dependent on mathematical preparation?

22. To what extent is there a tendency in emphasizing applications of the mathematics to introduce elementary mechanics, physics, thermodynamics, etc., in the courses in mathematics?

23. How far and in what manner are mathematics and engineering, or allied subjects, correlated?

24. What is the attitude of professional and applied science departments toward pure mathematics as to time allotment, aims of instruction, etc.? Do those departments prefer to teach such mathematics as they desire?

25. To what extent is the mathematical curriculum restricted by congestion of subject matter in the engineering courses?

26. To what extent does the mathematical curriculum for technological students correspond with that for collegiate students? (Compare 11.)

27. What instruction is given in history of mathematics?

28. What changes have taken place in the matters covered by questions 19 to 27 during the past 10 years, and what changes are present tendencies likely to cause? In particular, any present or projected extension of the usual four-year technological course affecting the mathematical instruction should be stated.

Aims and Methods of Teaching—Examinations.

Brief description of aims and methods of teaching, indicating relative emphasis, and in particular—

29. Aims in teaching as to relative emphasis on different results—e. g., mathematical dexterity, analytical power, logical keenness, accuracy in computation. To what extent are our students—collegiate or technological—gaining from their mathematics either general culture or mathematical power and resourcefulness?

30. Extent to which lectures, oral recitations, blackboard work, written tests, criticism of student's work in class or privately, are used. Are so-called seminar methods found useful in teaching undergraduates? If so, in what subjects?

31. Are definite programs of elementary courses prepared in advance; and, if so, are they duplicated for teachers and students?

32. Manner in which records are made up, and extent to which they depend on term work or a final examination.

33. Degree of importance attached to independence in ordinary problem work, and steps taken to secure or test it. Is problem work criticized and returned? If so, by whom?

34. Extent to which personal conference of students with teachers is employed.

35. Normal amount of teaching for teachers of different grades, and extent of their incidental duties.

36. Average size of classes in principal subjects. If instruction is coeducational, state proportion of women students.

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37. Use made of models. Are models made by students?

38. Is mathematical drawing or other work of laboratory character required or offered by the mathematical department?

39. To what extent are students allowed, or advised, to use tables of formulas in examinations or in the classroom?

40. What changes in methods of teaching have been made during the past 10 years, and what are present tendencies?

PREPARATION OF TEACHERS.

41. What kind and extent of preparation seems to you most desirable for members of your staff? For example: An academic or a technological undergraduate course (or both) followed by graduate work in mathematics? Do you consider it practicable and desirable to secure teachers who either before or after their graduate work in mathematics have had actual engineering experience? What importance do you attach to previous teaching experience in college teaching? In secondary teaching? (See also question 13.)

42. Do you favor a systematic attempt on the part of technological schools or departments to prepare students for mathematical teaching? Should technological students of exceptional mathematical ability be induced to specialize mainly in mathematics?

43. Is it your opinion that colleges or technological schools should provide for undergraduate courses in the pedagogy of mathematics?

44. State, if possible, the total number of different persons who have given instruction in your mathematical department, or departments, during the decade 1899–1909.

45. Do you favor permanent or protracted retention of teachers in rank below that of assistant professor?

III. REVIEW OF REPORTS OF SUBCOMMITTEES ON INDEPENDENT TECHNOLOGICAL SCHOOLS AND ON TECHNOLOGICAL DEPARTMENTS OF COLLEGES AND UNIVERSITIES.

This review is based in part on the actual subcommittee reports, in part on other sources. While the subcommittee reports are intended to be primarily descriptive accounts of existing conditions and tendencies, with incidental expressions of opinion, the present review undertakes to deal with the subject in a somewhat broader general manner in the light of whatever information and experience are at the disposal of the committee, but always with reference to current conditions.

ORGANIZATION AND STATUS OF MATHEMATICAL STAFF.

The size, personnel, and proportion of men in different grades are in each institution a matter of more or less complex evolution, affected by many personal considerations. The mere size of the mathematical staff depends for its significance mainly on the relation it bears to the number of students, a relation not easily determined in the case of the institutions having a single mathematical staff for academic and technological students. In the judgment of the committee a department should normally have not less than half its

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members of professorial grade, including assistant professors. Comment on the qualifications desirable in junior teachers will be made later.

The departmental organization and the relation of the mathematical to the other departments appear to be relatively simple and elastic, as is naturally desirable. The extent of departmental organization existing or needful naturally varies widely with the size of the department and with the range of experience and attainments among its members. It appears to be generally recognized, as it should be, that men worthy of appointment even as junior teachers are entitled to a high degree of freedom as to methods of teaching. On the other hand when large classes are distributed in small sections among a number of teachers there should be control or approximate agreement as to subject-matter, aims, and rate of progress.

The very limited extent to which theoretical mechanics and descriptive geometry are taught in the mathematical departments seems to the committee unfortunate, and will be discussed in connection with the mathematical curriculum below.

ENTRANCE REQUIREMENTS IN MATHEMATICS.

The usual entrance requirements in mathematics for technological schools and departments include elementary algebra and plane and solid geometry. A considerable number of institutions require also plane trigonometry, a few add advanced algebra, and a few arithmetic. The following definitions of the more usual subjects, prepared by a committee of the American Mathematical Society in 1903, have been adopted by numerous institutions and by the College Entrance Examination Board.

Elementary Algebra.

The four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions, ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and of numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities, that can be solved by the methods of linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents; the formulas for the nth term and the sum of the terms of arithmetic and geometric progressions, with applications.

It is assumed that pupils will be required throughout the course to solve numerous problems which involve putting questions into equations. Some of these problems should be chosen from mensuration, from physics, and from commercial life. The use of graphical methods and illustrations, particularly in connection with the solution of equations, is also expected.

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Plane Geometry.

The usual theorems and constructions of good textbooks, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle. The solution of numerous original exercises, including loci problems. Applications to the mensuration of lines and plane surfaces.

Solid Geometry.

The usual theorems and constructions of good textbooks, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders, and cones; the sphere and the spherical triangle. The solution of numerous original exercises, including loci problems. Applications to the mensuration of surfaces and solids.

These definitions, eliminating minor variations in the existing definitions of different colleges, were framed with a view to simplifying the elementary algebra by omitting certain non-essentials, and at the same time enriching it by the introduction of graphical methods and of more numerous problems. At present an attempt is in progress to define geometry less vaguely by means of a standard syllabus.

The current unit-scale of the Carnegie Foundation and the College Entrance Examination Board rate these subjects as follows:

Algebra 1½, plane geometry 1, solid geometry ½, trigonometry ½, a unit being supposed to represent a year's work in the school with four or five exercises per week. The total admission requirements of a college or technological school of normally high standards amount to 14 or more such units.

The few institutions requiring advanced algebra differ very widely in their definitions of it, and it appears to be the general opinion that this subject is within the proper range only of the exceptionally able student in an exceptionally strong preparatory school. As to plane trigonometry as an entrance requirement there is some difference of opinion. It is generally recognized that the concrete trigonometry with its solution of practical problems is quite within the grasp of preparatory students and of decided interest to them in its application of the combined resources of geometry, arithmetic, and algebra. The same can hardly be said, however, of those theoretical portions of the subject so important for later mathematical work. It is also important to bear in mind that in the average secondary school sufficient emphasis will rarely be laid on accuracy in computation for the needs of the future student of engineering. Some institutions prefer that all the time available for mathematics in the high school should be devoted to the maximum degree of thoroughness in the elementary algebra and geometry rather than to a program including trigonometry also. Wherever elementary trigonometry can be completed without sacrifice of such thoroughness, it is probably desirable that it should be included. It does not appear that any increase in mathe-

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matical entrance requirements beyond elementary algebra, plane and solid geometry, and plane trigonometry, as above defined, is either probable or desirable.

As to a specific requirement in arithmetic, the vital importance of accurate computation and the marked inability of entering students in this direction are generally recognized. Only a few institutions, however, seek a direct remedy for this inability by an entrance requirement in arithmetic; some expect the examination in trigonometry to be a more or less adequate test; some include numerical computation in the algebra and geometry papers. The efficacy of any of these methods is limited.

As to defective quality of preparation, the causes are probably far too deep-seated to admit of anything more than gradual amelioration. The demand for preparation in mathematics is so large that the elementary teaching must be often entrusted to persons not specially qualified for successful mathematical teaching either by natural endowment, interest, or training. The financial rewards of the teachers are usually small. On the other hand there has been a marked improvement in textbooks, in the establishment of periodicals for secondary teachers, and particularly in the organization of local associations of teachers of mathematics—including both school and college teachers—for the discussion of professional topics.

As to the school programs, it is obviously important that the study of mathematics should not have been discontinued during the final year of preparation. A candidate who was adequately prepared a year or more before entrance may have lost much during the interval, and such losses are probably more serious in mathematics than in most other entrance subjects on which the dependence of later work is less direct.

MATHEMATICAL CURRICULUM.

In all the institutions mathematical instruction is continued from the lower limit determined by the respective entrance requirements, with more or less review overlapping, through at least a first course in the calculus, thus including additional algebra, trigonometry (if not passed at entrance), plane analytic geometry, as well as the elements of the calculus. In the stronger institutions the elements of solid analytic geometry are usually added, and the above program is completed by the end of the second year, the calculus extending through the whole of this year; in them an elementary course in differential equations is also generally required, at least of students in mechanical or electrical engineering. Among subjects less frequently required spherical trigonometry and least squares may be mentioned. A considerable number of institutions, mostly universities, offer a wide range of advanced electives including, for example, projective geometry, Fourier's series, vector analysis, theory of elasticity, hydro-

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dynamics, theory of functions, etc. Few undergraduate engineering students find time, however, in a four-year course for such electives.

An interesting analysis of the mathematical curriculum in 17 representative institutions may be found in Prof. E. J. Townsend's valuable contribution to the Chicago symposium. It is there shown that "the average number of recitations given to each subject for the 17 institutions is approximately as follows: College algebra 50, plane trigonometry 46, analytic geometry 80, and calculus 130," this last usually including also a short course in differential equations. The range of variation is notably wide, in algebra from 15 to 90 exercises, in plane trigonometry from 29 to 70, in analytic geometry from 55 to 110, in calculus from 70 to 180. In interpreting these figures it must, however, be borne in mind that the institutions differ not only in their entrance requirements but in the strictness with which these are enforced, that the boundaries of the various subjects are not invariable, and that a relatively small time allotment may be compensated by a large requirement of outside preparation, or by more efficient methods of teaching, as subdivision of classes into smaller sections, or otherwise. The length of recitations is also not uniform and it may well be doubted whether 6 recitations per week for 15 weeks can be considered exactly equivalent to 3 per week for 30 weeks, or 2 per week for 45 weeks. Only one of the 17 institutions specifies a separate course in scientific computation, and this as an elective.

There is no apparent tendency to extend the program of required mathematics for engineering students beyond elementary differential equations. The extension of the engineering course to five years would probably favor such changes as the introduction of more thorough and extended courses in calculus, in mechanics, etc., and on the other hand the encouragement of elective mathematics.

The total time assigned to mathematics naturally varies with the general condition of the curriculum as to congestion or the reverse, and with the attitude of the administration and faculty as to where the boundary shall be drawn between mathematics and applied science. The congestion referred to, together with the development of mathematical criticism, and other causes have tended to compel more or less revision of textbooks in which the following tendencies may be noted:

In college algebra, the omission or postponement of such topics as series, partial fractions, undetermined coefficients, and the close articulation of the subject with analytic geometry and calculus, by insistence on the use of graphs, and by the early introduction of the ideas of function and derivative;

In analytic geometry, a similar tendency to employ calculus methods and to broaden the range of curves studied;

In calculus, a much earlier introduction of the fundamental ideas of function and derivative, as already noted, diminished emphasis on

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such matters as indeterminate forms, the avoidance of defective proofs, and the use of a much wider range of applications, including such matters as velocity, acceleration, attraction, moment of inertia, etc., a process naturally continued in differential equations.

Two current tendencies already noted have particular interest:

1. A better correlation between mathematics and engineering branches by the introduction of numerous and varied applied problems, or in some cases by insistence upon a thorough course in mathematical mechanics, and

2. A unification of the mathematical curriculum involving the redistribution of the whole subject matter according to its difficulty or its needfulness as an auxiliary, with little or no reference to the traditional division of subject matter into algebra, analytic geometry, and calculus.

The former change in its limited form has become rather general. The latter is still in the experimental stage.

CORRELATION OF MATHEMATICS WITH TECHNOLOGICAL SUBJECTS.

The introduction of applied problems connects itself with a gradual change of attitude on the part of the mathematical teachers, with the increasing development of applied mathematics both inside and outside the technological institutions, and with the criticism by physicists and engineers of the older, more abstract mathematical teaching, as illustrated by the following quotations from a distinguished engineer in the Chicago symposium:

> Abstract mathematical studies, if pursued as a kind of intellectual calisthenics, may produce a pure mathematician, but they may unfit a man for practical engineering.
>
> Mathematics is used in engineering to express the quantitative relations of natural phenomena. The mathematician delights in the relations; he divorces them from the phenomena and gives them abstract expression, while the engineer is concerned with the natural phenomena; he demands the physical conception; the medium of expressing these relations is of secondary consequence.

Such passages might be multiplied indefinitely from recent discussion, oftentimes coupled unfortunately with remarkable exaggerations and not less remarkable remedial suggestions.

For the 1910 meeting of the Society for the Promotion of Engineering Education the following questions were issued by the president in advance:

> 1. What proportion of the students in engineering schools, who have completed the required work in calculus, are able to apply that knowledge and solve simple practical problems?
>
> 2. What proportion of the graduates of engineering schools, who receive instructions in calculus and in its applications to mechanics, thermodynamics, and engineering, are capable of using calculus as a tool, readily, with difficulty, or not at all? etc., etc.

The answers to these questions by members of the society are obviously rough estimates—the questions themselves not admitting of

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exact answers—and vary far too widely to have definite quantitative significance. They leave no doubt, however, as to the existence of a serious need. Even if, as is claimed by some of the mathematicians, the difficulty is largely due to the inherent conditions of student human nature, and to the disposition of some of the engineering teachers to expect the impossible, it is only the more important that mathematicians should cooperate in maintaining the best relation between their subject and those which follow it.

Mathematical teachers and textbooks have both made progress in this direction. The tendency of the best modern texts, particularly in the calculus, is to emphasize the power to analyze and state problems mathematically and to interpret the solutions. This tendency has naturally had its enthusiastic votaries who have gone to the extreme of concreteness, including problems not merely of mechanics but of technical engineering. The serious objections to this are that under ordinary time limitations such matter can only be taught at the cost of needful thoroughness in mathematical technique, and that the successful dealing with these problems presupposes wider acquaintance with engineering data than the students concerned can generally have. Whatever may be appropriate for the exceptional student of previous technical experience, the average graduate needs a solid foundation in mathematics as such, and in mechanics, before attempting to deal with engineering problems. When he has laid that foundation it is better economy of time for him to be turned over to the engineering specialist, who should in turn have a sufficient mathematical training to utilize all the mathematical power his students bring to him. If not thus utilized it speedily atrophies.

Something has been accomplished already, and more will probably be accomplished in this direction by including a larger number and a wider range of applied problems in the mathematical courses. It seems to the present committee, however, of great importance that the general course in calculus should be followed by a thorough course in mechanics presented from the mathematical standpoint. Mechanics is commonly taught to some extent as a branch of general physics, to some extent also under the title applied mechanics or otherwise by one or more of the engineering departments. The vital importance and fundamental position of the subject are certainly such as to make it wise to present it from all three sides, the mathematical, the physical, and the engineering, at whatever expenditure of time this may require. On the mathematical side the need may be met either by having a substantial course in theoretical mechanics given by the mathematical department, or by the existence of an independent department of mechanics with sufficiently mathematical tendencies. The choice between these alternatives may naturally

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depend more or less on personal and local consideration. Without such emphasis on the mathematical side of mechanics the continuance of a gap between mathematics and engineering may be regarded as inevitable.

The argument for a more mathematical treatment of descriptive geometry is similar in kind, but the difficulty and the need appear to be less serious in degree. It is not of course the opinion of the committee that either mechanics or descriptive geometry should be taught wholly in the mathematical department, but rather that each should be strengthened on the mathematical side.

The so-called "Perry movement" in England and certain phases of current mathematical reform movements in Germany and France have aspects in common with this increasing attention to applications of mathematics, but this is eminently a matter in which local considerations must have great weight. American conditions are so different from English, German, and French as to preclude exact comparison, much more the adoption of foreign models or methods. A swinging pendulum passes from one extreme to the opposite, and the best current opinion in this country is not in sympathy with changes so radical as some which have been advocated in England. It is cogently urged that while mathematicians must teach their subject to the engineering students always with due appreciation of the uses to be made of it, with due subordination to abstract theory, with due care to facilitate the transition from mathematics through mechanics to engineering, they should on the other hand never be led away from this fundamental and difficult task in an ineffective effort to teach a little engineering prematurely by employing illustrative problems which are not yet wholly intelligible on the technical side. Thirty years ago current mathematical texts in the calculus contained none but geometrical applications. Now such physical subjects as velocity, work, and attraction are not only introduced as applications, but they are introduced at a very early stage for the still more important purpose of making the fundamental conceptions of derivative and integral more completely intelligible and significant. This wider sweep of applications undoubtedly sacrifices something of the previous unity and formal simplicity of the subject. The gain in interest and significance to the student far more than offsets this.

An exceedingly important form of correlation, apparently overlooked or underestimated by some of the engineering critics of current mathematical teaching, is that it is at least as much their own duty as that of the mathematicians to teach the use of mathematics as a tool, or let us say, rather, as an instrument or method. The teacher of mathematics usually needs all the time he has to teach his own subject and to meet the engineering teacher halfway by teaching

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general nontechnical applications. It is the part of the teacher of engineering to familiarize himself with the mathematical subjects, the methods, and even the notation his students have learned. Then he can teach them how to use their mathematics with a success and completeness not possible to his mathematical colleague. It is as ineffective and uneconomical to require a mathematician to teach engineering as to require an engineer to teach mathematics. Each must aim at the best attainable correlation with the other.

UNIFICATION OF THE MATHEMATICAL CURRICULUM.

The recasting of the series of elementary subjects into a consecutive course in mathematics presents many interesting aspects. In a striking passage of his Elementarmathematik vom höheren Standpunkte aus. I, 1908, Prof. Felix Klein draws an interesting contrast between two systems of mathematical thought and development. In the first—

> a particularistic conception of mathematical science is fundamental, dividing the whole into a series of well-defined provinces. In each of these one seeks to gain his ends with the minimum use of outside means or dependence on allied branches. The ideal is a structure of each division beautifully crystallized out and logically complete in itself.

The other system, on the contrary—

> lays the chief emphasis on an organic interrelation of the separate branches, and on the numerous suggestions they afford each other. It prefers, accordingly, the methods which open up the simultaneous understanding of several branches from a unifying standpoint. Its ideal is the comprehension of all mathematical science as of one entity.

Recognizing the great part which each system has played in the development of mathematics he earnestly deprecates the predominance of the former in the mathematics of the schools, under the influence of Greek geometry and of the great eighteenth century analysts, who developed algebraic theories of infinite series and the like, with careful avoidance of the newer calculus methods.

The recent experiments in unifying the mathematical curriculum of the technological course represent a reaction against this prevalence of the first system distinguished by Klein. In discussing them it may be noted first that a similar tendency has some time since led to the introduction of the elements of analytic geometry in the form of graphs into the preparatory instruction in elementary algebra, and that there is a tendency in recent textbooks of elementary geometry to depart more widely from strict Euclidean traditions. The revision of the more advanced program has sometimes taken the partial form of merely eliminating college algebra or analytic geometry as a distinct subject. In one recent case the process has been carried further by combining the algebra, analytic geometry, a first course in calcu-

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lus, and elementary differential equations into a single course and textbook.

Among the characteristics of this revision are:

The earlier introduction and consequently more prolonged study of the calculus ideas and methods, function, derivative, etc.;

The treatment of analytic geometry rather as a general mathematical method than as a separate subject, with less emphasis on the conic sections and more on the geometric interpretation of a great variety of equations, including parametric forms;

The consecutive discussion of functions of one variable by the methods of algebra, analytic geometry, and calculus;

The subsequent combination of solid analytic geometry and partial differentiation in a briefer discussion of functions of two variables.

The working out of such a program is necessarily attended with some sacrifice of formal simplicity, and with occasional apparent loss of continuity. The advocates of it believe that such a thorough revision has, by testing values and eliminating non-essentials, effected considerable economies in time, and that the advantages of the plan will decidedly outweigh these defects, particularly as more prolonged experience facilitates the actual teaching. The student should for example gain power of discriminating attack by the use for each problem of the method best adapted to its solution. Such a program may prove less easy both to teacher and student, but may at the same time be none the less worth while. The chief difficulties to be guarded against are apparent or excessive discontinuity of subject matter, and the corresponding dispersion of interest and attention on the part of the student. He finds it difficult to grasp the unity of mathematical analysis, and easy to lose the thread in passing from the methods of algebra to those of calculus and then of trigonometry. It must be borne in mind, however, that this sort of transition is just what must be easily made in any successful application of mathematics, and that the relative ease of completing a somewhat arbitrarily defined subject and then passing to the next may be too dearly purchased. The result of the experiments in this direction will certainly prove of much interest.

In comparison with the current reform movement in Germany, which also aims at increased and early emphasis on the ideas of function and derivative, the American institutions have a certain compensating advantage for the more limited mathematical preparation of their entering students, in the fact that the higher institution here is able to determine the form and content of mathematical work farther back than would be the case abroad, from about the point indeed at which such changes would naturally take effect.

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AIMS AND METHODS OF TEACHING—EXAMINATIONS.

Methods naturally depend upon aims, and a discussion of aims is essentially a discussion of the relation of mathematics as a part to technological education as a whole. The first essential aim of technological education is professional efficiency, which must naturally depend in some measure on command of mathematics as a tool. A less superficial analysis must recognize the distinction between immediate usefulness and ultimate efficiency, between training for subordinate positions and education for posts of large professional responsibility and leadership. A broader view must reckon with the fact that the student is to become an educated man and a citizen, not merely an engineer, and that his success even as an engineer will be incomplete if his education has been too narrow.

It is such considerations as these, recognized as they are both by the stronger institutions and by the leaders of the engineering professions, that must be reckoned with in any attempt to determine or to state the aims of mathematical teachings. In the limited time ordinarily available some degree of skill in mathematical technique, in computation, in the solution of equations, in differentiation and integration, some degree of power in applying mathematics to concrete problems must be given to all who are to complete technological courses. To the more capable student at least the teaching and study of mathematics should not, and does not, confine itself to these objects. To them there will come some recognition of the vitality of the science and of the inevitableness of its fundamental notions, as expressions of any exact thinking about phenomena, some due appreciation of the combined elegance and power of its methods, some ability to think mathematically. Such results can of course be accomplished only by teachers who are really mathematicians, and who therefore, unlike certain critics, see in their science something more than an elaborate computing machine or slide-rule. It is on teaching inspired by such aims that technological education must depend in part for that breadth and culture value which it ought always to have. The historical point of view should naturally find due recognition in this connection.

The methods employed in mathematical instruction tend in general to hold the student responsible for continuous study of a textbook and for the solution of many problems, with relatively little dependence on final examinations. Lectures are employed but sparingly, larger classes are divided into numerous sections, the average size in the stronger institutions not exceeding 15 to 20. The amount of classroom work per teacher in these institutions is ordinarily 12 to 15 hours per week, but in others may reach 20. With four or five small sections the teacher is expected to acquire personal knowledge of the individual student and his needs, and special provision for private con-

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ference is not infrequent. So-called "mathematical laboratory" work, the drawing of careful plots, and the making of models are precluded in general by lack of time, but the student's work in the laboratories of physics, mechanics, and engineering serves a similar purpose.

As to the use of tables of mathematical formulas for integration and other purposes, usage varies widely. Mathematical teachers are generally averse to encouraging the relatively mechanical use of such aids. It seems fair to suppose, however, that before the completion of the mathematical course students may advantageously be instructed in the use of such mathematical tables as will be of most future service to them, without which, indeed, their mathematics may remain largely unused.

PREPARATION AND QUALIFICATIONS OF TEACHERS.

The ideal teacher of mathematics for technological students, besides the qualifications desirable in teachers generally, needs on the one hand to be a mathematician by natural endowment and by training, on the other hand to have intelligent appreciation of the mathematical needs of future engineers, and sympathetic interest in their point of view. This naturally presupposes previous occupation with and some measure of attainment in applied mathematics. Capacity for mathematical investigation, while naturally desirable, is not indispensable, but some form of scientific productivity may well be insisted upon. The particular method by which the individual teacher has acquired the qualifications stated is of minor importance in comparison with the personal considerations involved. Under present educational and industrial conditions the supply of competent teachers will doubtless long continue to fall short of the demand; only a small minority of technological students will engage in teaching, and the number of men of engineering experience possibly available for mathematical teaching may be safely characterized as "an infinitesimal of higher order." In the judgment of the present committee the future teacher of mathematics to technological students should have taken an undergraduate course, either technological or including a substantial amount of physical science with laboratory work. Such a course should be strong in pure and applied mathematics, and should be followed by graduate study, also including both pure and applied mathematics, and leading in general to the doctor's degree. This plan is believed to be as simple and economical as possible, but by no means the only one for reaching the normal professional standard. The graduate work will in general be taken at a university, and it is important that the candidate should be enabled under the rules of the university to avail himself of opportunities for advanced work in mechanics, mathematical physics, or engineering with full credit toward his degree.

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The importance of previous experience varies widely with individuals, and only the stronger institutions will be able to insist upon it for minor appointments. Experience in secondary teaching, if not too prolonged, may have particular value from its frequently greater systematization, and still more in giving the future college teacher intimate knowledge of the conditions and methods obtaining in the schools from which his students are to come.

IV. CONCLUSION.

The history of mathematics exhibits many alternations of interest between pure and applied mathematics. The needs of astronomers or physicists have stimulated the development of a certain branch of mathematics, the development has been continued by mathematicians with more or less indifference as to the applications until the vein has perhaps been worked out. At present in the United States the pendulum seems to be swinging toward increasing interest in applied mathematics, at any rate up to differential equations, with probability of resulting advantage both to mathematics itself and to the allied sciences. Toward this change the technological institutions and the development of technology have contributed much by presenting problems requiring the development of new mathematical methods, by creating a need for the thorough mathematical teaching of great numbers of students, and by promoting through their reaction on the universities and on the public a widespread interest in the applied sciences.

Not many technological institutions or departments have yet encouraged research in applied mathematics, or undertaken to train future teachers of mathematics. Not many technological students have capacity for mathematical research or inclination for mathematical teaching. It is fair to expect that as the stronger schools gain in resources, and as the excessive demand for their graduates slackens with the increasing supply, they will build up graduate departments in which advanced work in mathematics will be an important element. At the same time the graduate schools of the universities with more liberal recognition of applied science will attract a larger proportion of technological graduates.

There is evidence that the technological schools and departments are reacting from over-emphasis on purely professional training and efficiency in favor of the fundamentals of general scientific education. The leading universities already require two years of academic instruction preceding the technological. While it seems improbable that the completion of an academic course will become a prerequisite for admission to the technological, a considerable and probably increasing number of students are likely to follow this plan.

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On the whole the situation of mathematics and mathematical teaching in the technological institutions, if not altogether satisfactory, may be regarded as at least relatively so, in the sense that needs are recognized and conditions are favorable for steady progress. There is a just basis for high expectations as to the future development of the science which has owed so much of its past and present vitality to the insistent demands of astronomers, physicists, and engineers. In meeting these expectations measurably, in building a solid foundation for their engineering students, and at the same time in doing their part in that development of the science, it may well be the unceasing endeavor of mathematicians in the technological institutions to use their limited time economically and efficiently, studying the needs of the applied science departments sympathetically, enlisting all possible reciprocal interest, maintaining the dignity and integrity of mathematical science, not insisting too much on its rigorous refinements.

SUBCOMMITTEE 1. INDEPENDENT TECHNOLOGICAL SCHOOLS.

The following report consists essentially of an analytical study of replies received from 22 institutions, wholly or mainly technological in their character, to the questionnaire issued on behalf of the commission by the United States Bureau of Education. The text of this questionnaire and a discussion of the general subject may be found in the above report of the main committee. Certain statements of fact, applicable alike to the independent schools and to the university departments, have also been relegated to the main report.

I. ORGANIZATION.

Questions 2–15: Mathematical staff, degrees, experience, etc.; divisions of institution and relations to each other; relation of individual teachers to department and to administrative officers; distribution of work; method of appointment; tendencies to change.

Mathematical staff.—An examination of the mathematical faculties in the different institutions shows that a large proportion of all the professors, associate professors, and assistant professors hold one or more degrees above the baccalaureate degree. Among the instructors about half appear to hold such advanced degrees. Nearly half of the full professors and about a quarter of the assistant professors and instructors hold the degree of doctor of philosophy. Less than one-half of the full professors are graduates of classical colleges; something less than half seem to be graduates of technological schools or of the scientific departments of universities, while it is impossible to

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tell from the other degrees, Ph. D., etc., whether those who hold them were originally graduates of colleges or of technological schools. The degrees would indicate that the associate professors are for the most part graduates of technological schools or the scientific departments of colleges. Among the assistant professors there seem to be more college than technological graduates, although, as in the case of the full professors, the degree of doctor of philosophy does not indicate the course pursued. The majority of the instructors are from technological schools, although quite a large number are from colleges. There are also a few who have the degree of doctor of philosophy, but this does not indicate the kind of institution from which they first graduated.

Among the full professors a very large majority, if not all, have done advanced, or specialized, work; probably more than half of them in mathematics and more than half of them in engineering or related subjects. The others have specialized in physics and chemistry. A large proportion of the assistant professors also have had university training, and most of these have specialized either in mathematics or advanced engineering work. The graduate work of instructors is stated in so few instances that it is impossible to make any general statement or draw any conclusions.

It is evident from the above statement that the technological schools expect professors and assistant professors to have done graduate work, usually in the line of mathematics, but the work in engineering is esteemed so desirable that a man who has specialized in that rather than in mathematics may be appointed to a mathematical assistant or full professorship. It is also evident that the institutions expect the men who hold full or assistant professorships to have carried their advanced work to such a point that they have received an advanced degree.

The first degree granted by the technological schools is usually bachelor of science (B. S.), with or without added specification of department. Several, however, give the professional degree civil engineer (C. E.), etc.

The mathematical department is wholly independent of other departments, but generally under the control of the whole faculty so far as the amount of time to be devoted to mathematics is concerned and sometimes as to the individual subjects taught.

The department as a rule has a head who exercises general control over the other instructors, but these instructors appear to be practically independent in the conduct of their classroom work.

The members of the department are not restricted by the administrative officers either in the subject matter or in their methods, except in case of two institutions where the subject matter is laid out and general methods suggested in a conference between the head of the department and the president.

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In the majority of institutions the advanced subjects are taught by the older professors, but in three institutions the professors and assistant professors meet all classes; in two institutions work is assigned without reference to rank, but according to fitness; and in one institution advanced elective subjects, like differential equations, least squares, etc., are taught in the engineering departments.

In the majority of technological schools meetings of members of the department are held irregularly for the discussion of topics connected with current teaching work and in a few of the institutions regular meetings for the same purpose are held. These meetings are generally for no other purpose, but in the case of a few institutions general mathematical subjects are discussed. The tendency to hold such meetings is naturally stronger in the larger institutions where 10 or more men have charge of different sections of a class. In two institutions there are daily meetings for the teachers of the different sections of the same class.

In the majority of the technological schools the mathematical department teaches mathematics only. In a very few cases mechanics is taught, and in two instances descriptive geometry.

Vacancies are usually filled by the board of trustees upon the recommendation of the president. This is virtually an appointment by the president. In nearly all cases the head of the department is consulted by the president, and usually the head of the department nominates to the president either directly or through the dean.

In most of the institutions considered there have been no recent changes of organization, and no changes are deemed desirable. A few institutions express the wish that the different branches of mathematics might be better correlated, and some desire a closer correlation between the mathematical department and the engineering departments.

II. MATHEMATICAL CURRICULUM.

Questions 16–28: Entrance requirements; outline of curriculum; elective subjects; mathematical needs and attitude of other departments; correlation with allied subjects; time restrictions; tendencies to change.

Entrance requirements.—Nearly all the institutions admit students on the basis of high-school certificates. Nearly all require elementary algebra, plane and solid geometry for admission, the definition of these subjects corresponding with those recommended by a committee of the American Mathematical Society in 1903. (See page 14.)

In a few cases other mathematical work, usually plane trigonometry, may be offered.

Where a definite minimum age limit is given it is usually 16 or 17 years, but so far as the answers indicate the actual age of entrance is from 18 to 19, as for other collegiate courses.

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As a rule the technological schools report that students are not well prepared in algebra and geometry. The students are said to be inaccurate, to be unable to reason, to have forgotten elementary principles. Several institutions call attention to the fact that algebra being given in the first two years of the high-school work, much is forgotten before the end of the course. One institution states that it must receive graduates of the high schools because it is a State institution. Some feel obliged to review high-school algebra in order to prepare the student for college algebra.

Few changes of entrance requirements have been made during the past 10 years, except that several institutions which did not formerly require solid geometry now do so. Several institutions suggest that trigonometry might be added to the requirements, but some of them say that it is so poorly taught in the high schools that its addition is questionable.

Curriculum.—College algebra, trigonometry, analytic geometry, and calculus are usually required of all engineering students. In a few cases the subjects taught under algebra are given in connection with analytic geometry and calculus. There seems to be quite a tendency to take up analytic geometry and calculus together, and in some places to begin their study early in the course. A few institutions offer elective mathematical subjects. In some cases special subjects are required in some courses; thus, differential equations may be required of electrical or mechanical engineers.

The textbooks used are the ordinary modern mathematical textbooks. In a few cases mechanics is taught in the mathematical department. In two institutions the mathematical work is very heavy, in one of these 7 or 8 hours being required per week during the greater part of the freshman and sophomore years; and in the other, from 9 to 15 hours per week during the first two years. In some instances the elements of spherical trigonometry are given to all students, while in others this work is reserved for the civil engineers.

Few institutions require mathematical work beyond calculus, but quite a number offer electives. Where more advanced work is required it is usually differential equations or mechanics. Most of the institutions do not desire to increase their requirements in this respect.

Nearly all the institutions agree that the course in mathematics has been determined very largely by the needs of the engineering departments. While the statement is not definitely made, it appears in many cases that the course of study has been laid out by the mathematical professors so as to give students as much mathematical training and power as possible, at the same time having in mind that these men are to become engineers and will need to apply their mathematics to engineering work.

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There is a tendency to emphasize the applications of mathematics by introducing problems in mechanics, physics, etc. The extent to which this can be done depends upon how much physics, mechanics, etc., the student knows. None of the institutions represented claim to teach physics or mechanics in the mathematical department; a few of the departments distinctly say that they do not give these applications, as it is their business to teach mathematics.

It is difficult to tell from the answers just how much correlation there is between the department of mathematics and the various engineering departments. The impression gained from reading the answers is that there is not very much correlation, certainly not so much as would seem desirable. Simple engineering problems are sometimes given in connection with mathematical work, but at the time the work is given students often do not understand the fundamental principles of the engineering subjects.

The professional departments seem not to interfere with the time allotment for mathematics, nor in general with the aim of instruction, although they sometimes desire to have more applications included in the mathematical courses. There are one or two exceptions to this, where it is alleged that the professional departments expect the mathematical department to teach the principles of engineering and to make applications. The engineering departments do not wish to teach mathematics.

About half of the institutions report that there is restriction of time on account of the congestion in the engineering courses; that the time for mathematics has been reduced to a minimum; and that the mathematical departments can not teach the subjects as they would wish to.

In most institutions no formal instruction in the history of mathematics is given, but many historical points are discussed informally in the classroom.

There is nothing to indicate that many changes have taken place during the past 10 years, or that many changes are contemplated. There is no indication that any extension of the four-year courses will affect mathematical instruction.

III. AIMS AND METHODS OF TEACHING—EXAMINATIONS.

Questions 29–40—Aims: Dexterity, power, keenness, accuracy, resourcefulness. Methods: Lectures, recitations, blackboard, tests, criticism, records, independence of work, conferences, amount of work for teachers, size of classes, uses of tables, tendencies to change.

Aims.—It seems probable that in defining these aims the professors of mathematics have stated the results which they would like to accomplish rather than those which they are actually obtaining. Some say that they do not strive for mathematical dexterity at all; others state that dexterity and accuracy receive the most attention.

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Several give their aims in teaching as follows: Analytical power, logical keenness, accuracy, mathematical dexterity. Several state that considerable culture and resourcefulness are obtained. The question has not been answered fully enough for satisfactory conclusions.

Methods.—It is evident that few lectures are given to undergraduates in the technical schools. Large classes are divided into small sections receiving independent instruction, but following a common program and taking the same final examination. Oral recitations are held almost every day, with a large amount of blackboard work. Written tests are frequent in all of the institutions. Student work is criticised in class freely, and in almost all of the institutions students have the opportunity to confer with the instructors.

Programs of elementary courses are prepared in advance in some of the larger institutions, but not to any extent in the smaller ones. These programs are intended for the use of the instructors, but are changed to suit conditions.

Records; examinations.—Final grades are usually based on term work and final examination, although in a very few institutions final examinations are not given. In some institutions the grade is made up of results of written tests, daily recitations, and final examinations. The weight given to each of these parts varies from tests four-fifths, final examination one-fifth, to daily work one-half, final examination one-half. Several institutions do not allow the final examination to count for more than one-third of the final grade.

Problem work.—About half the institutions seem to lay great stress upon independent problem work, and have problems corrected by student assistants or by instructors and returned to students. The answers from the other half would indicate that problems are not systematically criticized and that no special effort is made to secure independent work.

Conferences.—In the majority of institutions the mathematical professors have regular office hours, and students are encouraged or required to have conferences with the instructors. This is especially true with respect to poor students. In only a few institutions is it stated that there are no such conferences.

Amount of teaching.—About half the institutions require from 12 to 16 hours per week of teaching, the others from 18 to 20 hours. It is evident that professors and assistants professors often have considerable committee and other additional work. Instructors do not seem to have any committee work, but they are expected to give considerable time to correction of papers, etc.

Size of classes.—In only three institutions is the average size of sections above 25, while in quite a number of them it averages from 15 to 20. The majority of them do not have women students, and where there are women the number seems to be very small.

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Models; drawing.—In the majority of cases models are used to illustrate problems in solid analytics and calculus, but in a few cases it is distinctly stated that no models are used. In very few instances are the models made by the students.

Mathematical drawing and other laboratory work are not required or offered by mathematical departments with the exception of one institution.

Tables.—About half the institutions allow their students to use tables of integrals, while a smaller number allow tables of logarithms, and some others. A few do not allow tables at all.

Changes.—In the majority of institutions there have been no radical changes during the past 10 years.

IV. PREPARATION OF TEACHERS.

Questions 41–45: There seems to be considerable difference of opinion as to whether an academic or a technological course forms the better preparation for an instructor of mathematics in a technological school. A number of institutions suggest that both should be required. Practically all, however, agree that graduate work in mathematics is necessary. Nearly all believe that engineering experience is very desirable, but that it is almost impossible to obtain. There seems to be a great difference of opinion also as to whether previous teaching experience is desirable, some of the answers indicating that it is, and others stating very positively that it is not especially desirable for a young instructor who can obtain his teaching experience in the technological school. Nearly all agree that experience in a secondary school is not desirable.

The majority of the answers would indicate that a systematic attempt should be made on the part of technological schools to prepare students for mathematical teaching, although quite a large number have expressed a contrary opinion. Several of the answers call attention to the fact that the salaries offered mathematical teachers in technological schools are so low that few students care to consider such positions. About half of the answers favor inducing technological students of exceptional mathematical ability to specialize in mathematics; but some of the answers are decidedly against this. This may be interpreted to mean that the professors in the technological schools believe that students of exceptional mathematical ability have great opportunities as engineers and should not be induced to specialize in mathematics, thus giving up engineering careers.

It is the general opinion that technological schools should not provide for undergraduate courses in the pedagogy of mathematics.

Tenure.—In the majority of institutions the total number of different instructors during the past 10 years has been about twice as great

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as the number of instructors now in the department. This shows of course that the younger instructors change after a few years of service, presumably for the sake of increased incomes.

There is no unanimity of opinion in regard to the protracted retention of teachers without promotion. About half the answers indicate a belief that instructors should be retained permanently or for indefinite periods, while the other half indicate the contrary. The reasons are not given. There is probably a feeling that a man ought not to be held as an instructor after a certain period of years, because the salaries are usually very low, and he ought to find some work where he would be better paid. Some of those who do not favor keeping an instructor for a protracted period imply that they think if an instructor is worth keeping he should be given an assistant professorship.

The Agricultural and Mechanical Colleges.

These institutions were for the most part founded under the act of Congress of 1862, to which reference has previously been made. They include some of the separate technological schools on the one hand, and some of the State institutions on the other. It is convenient to group by themselves, however, those which concern themselves exclusively with agriculture and mechanic arts, and in which agriculture is a relatively important element. The classification is, however, not at all precise. The following notes based on replies from eight institutions may serve as a comparison of these institutions with the foregoing.

The majority of the heads of the mathematical departments have had scientific or technological training, and a majority of the associate professors seem to be graduates of scientific or engineering institutions; none of the latter are doctors of philosophy, and one has no degree. Of the instructors, a majority have had technological training; none hold the doctor's degree. In several instances members of the faculty give instruction in more than one department.

In one institution mathematics and engineering make one department.

In most of these institutions the requirements for admission are considerably lower than those of the technological schools, but there is a tendency upward. When an age limit is mentioned it is usually 16.

The mathematical curriculum usually includes some elementary algebra and solid geometry, followed by the subjects usually given in the other institutions. In most of them nothing is required or offered beyond the first course in the calculus. The agricultural and textile courses include less mathematics than the engineering.

The assignments of teaching average relatively high, amounting in some cases to 20 or 25 hours per week. The same is true of the size of sections, which is usually 20 or 30.

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SUBCOMMITTEE 2. TECHNOLOGICAL DEPARTMENTS OF COLLEGES AND UNIVERSITIES.

INTRODUCTION.

The following report is based primarily on the returns to the questionnaire prepared by the committee and sent out on its behalf by the United States Commissioner of Education, as stated in detail in the general report of the committee. These returns have been supplemented somewhat from other sources where such material seemed essential to illustrate the practical aspect of the question. In order to give full weight to the returns, this material is introduced in the form of a supplement to the main body of the report.

ORGANIZATION OF DEPARTMENTS.

The replies to the questionnaire indicate a marked uniformity in the mathematical departments represented with respect to organization as well as method and aim of instruction. The cause of this uniformity seems to be that technological departments of colleges and universities are very largely a direct outgrowth of the academic departments by which they were preceded. This is evidenced by the fact that in none of the institutions represented is there a separate department of mathematics for technology, the mathematical instruction for all courses being centralized in a single department and given by the same corps of instructors. It is also noteworthy that the mathematical department is, in general, independent of other departments, and not subjected to definite restrictions as regards subject matter or methods other than a general limitation as to the time allowance for the work.

In the smaller colleges no distinction is made between students of technology and others so far as mathematical instruction is concerned. In the larger institutions the engineering students are usually separated from the academic, chiefly for administrative reasons and not because of any essential difference in the method or content of instruction. The size of the sections into which large classes are subdivided is usually limited to 25 members, this number seeming to be considered the maximum which can be taught to advantage at one time by the ordinary blackboard and recitation method.

In the smaller institutions it is not considered necessary to hold regular meetings of the department. In the larger universities, however, such meetings are held with more or less regularity for the purpose of encouraging an esprit de corps among the teaching staff, and enabling the professor in charge to keep in touch with the work of individual instructors and the department in general.

From an examination of the degrees held by the members of the various mathematical faculties represented, several interesting facts are apparent. It is found that an engineering degree is exceptional,

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the degrees most commonly held indicating that the majority of instructors have had an academic training. There is also manifest an increasing tendency to employ only those who have shown special ability by taking a higher degree, preferably the Ph. D., implying specialization in pure mathematics. This fact is especially noteworthy in its bearing on the relations between the departments of mathematics and technology, considered later.

ENTRANCE REQUIREMENTS.

The returns show that it is the general custom to admit students to all departments of the college or university on presentation of a satisfactory high-school certificate. The mathematical preparation thus certified invariably consists of arithmetic, elementary algebra, and plane geometry, usually with the addition of solid geometry and sometimes plane trigonometry, as fully explained in the general report of this committee. Throughout the Middle West it is customary for the university to publish regularly an accredited list of high schools whose students are thus admitted on certificate without examination. The principals of the schools on this list are kept informed as to the requirements of the university and the progress of their graduates after entering, by a high-school visitor specially appointed by the university for this purpose. From the university standpoint this system is very effective, as it enables the university to secure a much more thorough and uniform grade of preparation than would otherwise be possible. From the high-school standpoint the system was formerly criticized as unwarranted dictation on the part of the university, by reason of the fact that only a small proportion of high-school students are preparing for university work. This objection is now obviated in all the larger high schools by offering a variety of courses, only one of which is college preparatory.

In some cases, especially where the system of accredited schools is not in vogue, the universities report that the high-school preparation in mathematics is deficient for university purposes. This deficiency is usually credited to the fact that high-school mathematics is ordinarily given in the first two years of the course, and that in the two years which intervene before entering the university much of the work is forgotten or obscured. Under the system of accredited schools, however, it is customary to specially strengthen the college preparatory course in this respect by thoroughly reviewing during the last year all the mathematics previously learned.

In this connection it is of interest to contrast the American system of teaching elementary mathematics for a short period and then dropping it completely with the continental method as exemplified by the French lycée and the German and Austrian Gymnasium, Real-Gymnasium, and Ober-Realschule, where the study of elementary mathematics is carried on continuously for eight or nine years.

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MATHEMATICAL CURRICULUM.

The extent of the mathematical curriculum is largely a question of breadth and thoroughness of training, the subject matter being nominally the same in all the institutions represented. The customary program of instruction includes algebra, trigonometry, and analytic geometry for four or five periods per week during the freshman year, and the elements of differential and integral calculus for the same number of periods during the sophomore year. During these two years much of the student's work is academic, whereas at the end of this period it becomes almost wholly technical. Mathematics is thus classed as an academic subject, at least so far as instruction is concerned, although mathematical principles are of course universally recognized as the basis of technology. As a matter of fact, only a small proportion of the mathematics actually taught is ordinarily used in engineering practice or in the succeeding courses in technology. As evidence of this fact the following statement may perhaps be as conclusive as any single fact that could be mentioned.

In returning a purely technical article that had been submitted to him for publication, the editor of one of the largest and most influential engineering journals in this country wrote as follows:

> While we find this an admirable treatise on the subject, we regret that it is too highly mathematical for our columns, due to the fact that it presupposes a thorough understanding of the principles of the calculus. It is our experience that the average machine designer has no, or at least only a vague, idea of the use of calculus.

This statement should perhaps be regarded as a criticism of the engineering profession in this country rather than as evidence that mathematical instruction is inefficient, or that a satisfactory technical education can be built up on such a limited mathematical basis as here implied.

This condition of affairs is no doubt as true for civil as for mechanical engineers. In electrical engineering, however, a somewhat higher degree of mathematical attainment is demanded, which is usually recognized by including differential equations as a required subject in this course.

The fact that ordinarily more mathematics is taught than actually used is sufficient reason why the returns to the questionnaire indicate no tendency to extend the mathematical requirements or to encourage electives in this subject.

CORRELATION OF DEPARTMENTS.

In the majority of institutions the needs of technological departments are at least nominally considered in arranging the work of the department of mathematics. Further than this there is no correlation of departments in any of the institutions represented in the returns. In a few of the smaller institutions the departments of mathematics

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and engineering are administered by the same head for economic reasons. In one instance it is specifically stated that not only is there no attempt at correlation, but that mathematics is taught as a separate discipline without reference to its technical applications.

UNIFICATION OF THE CURRICULUM.

Within the mathematical departments themselves there seems to be a general tendency toward rearranging the subject matter into a more compact and unified course. Effort is directed toward obliterating the formal boundaries which have been raised between the various subjects in the course of their historical development, and to construct a single course in mathematics in place of a succession of separate and somewhat unrelated courses in algebra, trigonometry, analytic geometry, and calculus. The most notable instance of this experiment is that being carried out at the Massachusetts Institute of Technology.

CORRELATION OF MATHEMATICS AND TECHNOLOGY.

The consensus of opinion on this topic is that in mathematical courses mathematics should be taught rather than applied science. It is generally believed that the introduction of technical applications in the mathematical classroom is advisable only when they are so elementary and familiar as not to destroy the integrity of the mathematical courses or diminish their educational value by obscuring general principles. All agree that no illustration should be used which requires a technical knowledge not possessed by the student or readily explainable to him, as the introduction of unfamiliar concepts merely offers the student two difficulties to surmount instead of one. The chief difficulty seems to be in finding technical illustrations which are sufficiently familiar, as the mathematical courses are confined to the first two years of the curriculum, and thus precede the student's professional training.

In one instance the objection is raised that by enlarging applications the concrete tends to fill so large a place in the mind that the principle in hand is obscured as one of general application. The general opinion, however, is that if it is possible to arrange courses in parallel, so as to furnish material for illustration, a training in formal mathematics in connection with its technical applications gives depth of understanding, strength of grasp, and freedom of use most conducive to the production of efficient and progressive students.

ATTITUDE OF DEPARTMENTS OF TECHNOLOGY.

The majority of replies state that technological departments are satisfied to leave the mathematical preparation of their students to the department of pure mathematics as at present constituted. In

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a few instances it may be inferred from the returns, however, that technological departments are not wholly satisfied with the present preparation in mathematics as a basis for their work and would prefer to have the subject taught by men more familiar with its technical applications. In connection with this, there is a tendency to diminish the amount of pure mathematics required of technological students, one reply going so far as to say that the subject (as now taught) is regarded by engineers as a necessary evil.

There is a substantial agreement that there is no reason why engineers should be given essentially different elementary training in mathematics from others, but that all mathematical training is simply a question of teaching the subject thoroughly and in such a way that the student shall be able to use it freely. From the standpoint of mathematicians separate departments of mathematics for different classes of students are regarded as narrowing and hurtful to all concerned, and regret is expressed that specialized professional courses are occupying an increasingly large place in the curriculum to the exclusion of a more thorough grounding in broad fundamentals

METHODS OF INSTRUCTION.

The method of instruction ordinarily pursued is based on the use of a textbook. Instruction then proceeds by assigning definite portions of the text, with daily recitations on the portion assigned, usually in the form of solving the accompanying problems in the text. The chief differences in applying this method consist in the manner of securing the required amount of problem work, some instructors relying chiefly on blackboard work during the class period, while others require independent outside work. The textbook method has the advantage of being simple and easy to follow, and from the point of view of the instructor doubtless produces more uniform results than could be obtained otherwise. It is open to criticism, however, as being conventional and stereotyped, and from the student's subsequent record in technology it develops that he is usually tied to the range of problems, and even the notation, given in the text studied, and is deficient in the freedom of use which comes from an actual mastery of fundamental principles.

Models are seldom used in the classroom and a mathematical laboratory is practically unknown.

AIM AND RESULTS OF INSTRUCTION.

The returns indicate that in deference to the opinions of departments of technology an effort is made to differentiate between mathematical instruction given to engineers and to others. For engineers the aim is to prepare for their professional courses by insisting on accuracy in computation and emphasizing such principles

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as are of immediate and practical application. At the same time it is the general opinion that there is a broad cultural value in mathematical training which engineers almost wholly miss by reason of the limitations to which their work in mathematics is subject. The cultural value of mathematics is defined in this connection as consisting in the concentration of attention on definite concepts and their inferences.

There are exceptions to this view, however, the replies having the greatest weight of experience back of them asserting that when mathematics is properly taught, although limited to technical subjects, engineers profit largely by this training aside from the specific value of the subject as a professional tool. This opinion, expressed by several, is summarized in one reply as follows:

Our successful students are gaining clearness and accuracy of thought, power of attack, and fertility of invention that place them far above men not thus trained. Almost invariably those students who have risen most rapidly to high positions of power and usefulness have been among the most brilliant mathematicians so far as they have chosen to cultivate mathematical subjects.

PREPARATION OF TEACHERS.

The consensus of opinion on this point is that it is desirable that teachers of mathematics in technological schools shall have had some technical training or experience, or at least be interested in the technical and practical applications of mathematics. It is not considered practicable, or even desirable, to secure teachers who have had actual engineering experience. One reason advanced is that the pecuniary rewards in engineering practice are so much greater than in teaching that it is impossible to secure desirable experienced engineers as teachers. It is also thought that practical experience extending over a number of years would actually disqualify one for teaching by putting him out of touch with college life and out of sympathy with the best educational methods and ideals. It is admitted, however, that the teacher of mathematics to engineers should have an adequate knowledge of the applications of the subject, as otherwise he would be out of sympathy with the aims of the school.

The cause of the difficulty experienced in securing satisfactory teachers in this field probably lies in the natural scarcity of men who prefer teaching to professional work, the preference naturally connecting itself with aptitude.

The most efficient training for a teacher of mathematics in a technological school is believed to consist of a technical collegiate education, or academic course with the election of numerous technical courses involving the applications of mathematics, followed by graduate work in pure mathematics. Previous teaching experience is thought to be desirable but not essential.

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It is emphatically asserted that mathematics should be taught by skilled mathematicians. The argument is that greater technical skill is required in mathematics than in any department of technology, and if the latter requires the services of specialists, mathematics can also be best imparted by experts in this particular line.

SUPPLEMENT ON SPECIAL METHODS OF INSTRUCTION.

I. THE TWO-HOUR SYSTEM AT HARVARD UNIVERSITY.

E. V. Huntington.

In certain courses in mathematics for undergraduates at Harvard University a special plan of instruction is followed which meets several important requirements in a large university.

Each large course (50 to 100 students) is in charge of a permanent member of the staff, assisted by two or more instructors recruited each year from the ranks of the graduate students. The course meets three times a week for two consecutive hours. In the first part of the period the professor in charge lectures to the entire class, explaining the method for solving the problems of the day. In the second part of the period the class moves into a large drafting room, where the students work out their problems under the immediate supervision of the instructors. That is, the three instructors, including the professor in charge, pass about the room from man to man, giving each man a brief individual conference on his work while the work is being done. These conferences are partly in the nature of a quiz, to make sure that the student is able to explain intelligently what he is doing; partly to give assistance over special individual difficulties; and partly to record the problem work. For this last purpose special individual record cards are kept. With these cards in his hand, the instructor has the complete record of each student before him when he approaches that student for his conference. No problems are "handed in" to be corrected out of hours; all the problem work done by the student remains in his notebook and is inspected and recorded by the instructor in his presence.

The work in the drafting room is quite informal, and the students are at liberty to discuss their problems with their neighbors. An essential feature of the plan, therefore, is a series of frequent short tests, usually every two weeks, in which each student works by himself. The marks for the course are chiefly based on these tests and on the usual mid-year and final examinations.

The chief advantages of the plan are that any difficulties the student may experience are cleared up at once; the instructor is enabled to keep in close and constant touch with the work of the class; and the university is able to avail itself of the services of experienced teachers who are taking graduate work on leave of absence from their own institutions, and are thus eligible for such temporary appointments.

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II. REDIRECTION OF EDUCATIONAL AIMS.

S. E. Slocum.

From the facts brought out by the questionnaire it would seem that mathematical instruction in technological departments of colleges and universities has not yet diverged very widely from the lines laid down as orthodox half a century ago or more, and originally intended as preparatory for one of the so-called learned professions. The rapid industrial development of recent years, however, has created a demand for a highly efficient and specialized form of technical training, in response to which a new type of school has arisen, known variously as trade, technical, manual, vocational, commercial, industrial, continuation or cooperative. This has been accompanied by a radical revision of academic standards, the popular ideal, at least, being that of a training which fits directly for industrial and social efficiency. This is evidenced not only in individual efforts at modification of the curriculum in many of our own institutions, but also in recent government legislation in Great Britain, France, and Germany.

The appointment of this commission is, in itself, a recognition of the fact that a new educational situation has arisen which demands special consideration, and the value of its reports will consist largely in informing teachers generally of the trend of our American educational policy and in harmonizing cultural ideals with the practical demand for industrial and social efficiency. To further supplement the returns to the questionnaire it therefore seems desirable to point out the most salient features of the new problem in technological education as apparent in the scheme of industrial cooperation, with special reference to its practical effect on mathematical instruction.

THE COOPERATIVE SYSTEM AT THE UNIVERSITY OF CINCINNATI.

The effect of any popular propaganda, such as the demand for vocational efficiency referred to above, is of course first apparent in secondary education, but, although of comparatively recent origin, the movement already shows an outcropping at the university level in several places, notably in the cooperative system established at the Lewis Institute, Chicago, and at the University of Cincinnati. The basis of this innovation is usually supposed to consist in the simple fact of mechanical alternation between school and shop, whereby a manual as well as an intellectual development is secured, and a trade acquired simultaneously with a profession. A more adequate and characteristic summary of the ideas underlying the cooperative system, however, is that given in the following extract from a recent article on the subject:

A definite line of communication has been established from the school to the forge and shop and railroad; from the laboratory and lecture hall, where the laws underlying and governing the work are formulated and made clear, to where men actually face

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the problems of progress. The embryo engineer travels back and forth between the two weekly, and always faces the task before he is brought to the science. The laws of nature, then, have for him an increased significance. Literature and the humanities have life. Fact and theory are in constant juxtaposition. That strength is gained which we call character, and a safe mental development based on physical effort is obtained in conformity to nature's laws. "Going to college" every other week from the workshop has a different meaning from "going to college" once from the high school. It becomes an opportunity that is denied other men in overalls and jumpers, and a corresponding feeling of indebtedness to the one not so favored develops. It means future cooperation rather than future misunderstanding and mutual distrust. We have applied the term "cooperative system" to this method of training as much in hope of its future results as in description of the method.

EFFECT OF THE COOPERATIVE SYSTEM ON MATHEMATICAL INSTRUCTION.

It is obvious that such an intimate correlation of the concrete with the abstract is bound to affect both the form and content of instruction, especially in the case of a basic science like mathematics. As an instance of this, the result of five years' operation of the cooperative system at the University of Cincinnati shows an increasing tendency to break down the barriers between departmental instruction in mathematics and allied subjects, particularly mechanics. Increasing emphasis is thereby laid upon mathematics as a general method, or, from another point of view, as the unifying principle underlying all branches of technology. The practical development of this idea in mathematical instruction in connection with the cooperative system has been gradual, accompanying the growth of the general scheme of correlation of departments and shops. Sufficient progress has already been made, however, to show that eventually the principles of elementary mechanics will be used for unifying mathematical instruction and correlating it with the manual experience of the student, as well as with other branches of technology. Effectual provision will thus be made for laboratory instruction in mathematics, long thought to be desirable, but difficult of satisfactory attainment.

In mechanics, which is taught by a separate department of applied mathematics, the cooperative viewpoint was adopted at the outset, although improvements in method are still being made. In detail, the method consisted primarily in urging each cooperative student to bring to the classroom for solution each week some practical problem in mechanics or the strength of materials which had come under his observation in the shop during the previous week. This simple plan for securing the active cooperation of the student in his own instruction put him in a receptive mental attitude, and at the same time greatly increased the practical and informational value of the course. By this method, individualizing of instruction, which hitherto has been an ideal rather than a reality, appears spontaneously, without

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effort on the part of the teacher, and the elimination of memory work is accompanied by a concentration of attention on methods and processes rather than their outcome. The most important features of this plan are that the student and his activities become the center of interest and his intellectual and manual activities so articulated as to act as mutual stimuli.

There can be no doubt that the current of modern educational thought is setting strongly in the direction of practical cooperation such as here indicated, as shown, for instance, by the results of the investigation carried out by the Manuel Général in France, and the impression which such men as Dr. Kerschensteiner, of Munich, are making upon the educational policy of Germany. The changes advocated, however, are not as radical as may appear at first sight, and no fear need be entertained as to the loss of any of the so-called cultural value of mathematical instruction if by culture is understood a well-rounded development of the individual rather than intellectual conformity to a rigid Procrustean standard.

CONCLUSION.

The facts here presented indicate that orthodox instruction in mathematics does not entirely harmonize with present ideals of material development. In justice to present methods it should be said, however, that this by no means implies that instruction in mathematics is less efficient than in other subjects. A comparison of results with those obtained in other departments, such as English or physics, will show no greater returns for a given expenditure of time and energy. The greater prevalence of criticism of mathematical instruction arises chiefly from the fact that any deficiency in this subject is more apparent than in others, as mathematics precedes technological subjects and serves as their basis. Moreover, the inability to use mathematical principles once taught may be more apparent than real, since it will often be found that when these principles are needed for application a brief explanation by the instructor in technology will suffice to recall them with all their original force.

There is perhaps more ground for the criticism that mathematical instruction at present is too formal and better suited to the needs of a specialist in mathematics than to a student of technology. The idea of formal discipline as an educational aim is, in fact, a thing of the past. A sufficient evidence of its futility in the present case is the difficulty which the average student experiences in making even simple technical applications of mathematical principles in which he has been carefully drilled. On the other hand, the fear that technical applications will lessen the cultural value of mathematics is groundless, as a principle or problem loses none of its theoretical importance because it also has a human or economic value. For instance, in

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such a prosaic field as shop management the well-known Taylor system has resulted in the development of a slide rule for handling 12 variables simultaneously, and the fact that its use increases the output of a machine 50 per cent by no means lessens its importance as an achievement of mathematical genius.

The whole question seems to resolve itself into the problem of making mathematics more expressive of modern conditions. Herbart asserts that interest is of fundamental pedagogical importance, and that interest is based on apperception, by which he means that no instruction can be assimilated until its relation to concepts already familiar is fully apparent. This indicates that even from a purely pedagogical standpoint mathematical instruction should proceed slowly and each new idea be followed out into as many of its ramifications as possible in order to provide the connective tissue needed to make education organic. It is suggested, therefore, that effort be directed toward making instruction in mathematics cumulative; that is to say, instead of placing the chief emphasis on the logical development of the subject and relying for practice on sets of unrelated problems illustrating merely a single phase or principle, its importance as the unifying principle underlying all exact methods of expression should be made apparent by a series of original applications of increasing complexity, each of which shall embody as much as possible of all preceding instruction in the subject. A graded series of practical problems in mechanics and engineering design arising out of the student's growing experience is typical of what is meant. Less ground might apparently be covered in this way, but there can be no doubt that the ordinarv student would make more substantial and lasting progress.

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BIBLIOGRAPHY OF EDUCATION FOR 1909-10

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CONTENTS.

	Page.
Introduction	9
Generalities:	
Bibliography	11
New periodicals	15
Publications of associations, societies, conferences, etc.—	
National	15
State and local	22
Foreign	38
International	39
Documents	39
Directories	39
History and description:	
General	40
Ancient	40
Medieval	41
Modern	41
United States—	
General	41
Public schools	43
Higher or university education	44
Canada	46
Central and South America	46
Europe	46
Great Britain	46
Secondary education	47
Higher or university education	48
France	48
Germany	48
Higher or university education	49
Holland	49
Italy	49
Russia	50
Switzerland	50
Turkey	50
Asia	50
China	50
India	51
Japan	51
Australia	51
Biography	52
Theory of education	54
Principles and practice of teaching:	
General	58
Methods of study	60

Digitized by Google

Principles and practice of teaching—Continued. Page.
Educational psychology 61
Child study 62
Child psychology 63
Plays, games, etc 64
Kindergarten and primary education 64
Elementary or common school education 66
Rural schools 66
Curriculum 68
Reading 68
Literature 69
Composition and language study 69
Languages 69
History 70
Geography 70
Nature study and science 71
Physiology and hygiene 71
Arithmetic 72
Penmanship 72
Art 72
Occupations and busy work 72
Music 72
Agricultural training 73
Secondary education 73
Curriculum 75
Languages 75
Literature 75
English and composition 75
Modern languages 76
Ancient languages 76
History 77
Civic 77
Economics 78
Geography 78
Mathematics 78
Geometry 78
Science 79
Physics 79
Chemistry 80
Botany 80
Biology 80
Zoology 80
Physiology and hygiene 80
Agricultural training 81
Business education 81
Education and training of teachers 82
Teachers' institutes, meetings, etc 82
Teaching as a profession 82
Literary material, fiction, etc 82
Normal schools 83
Pedagogy in universities 83
International exchange of teachers 84

Digitized by Google

Principles and practice of teaching—Continued. Page.
Higher education 84
Salaries and pensions 86
Scholarships 87
Supervision and administration 88
Organization and methods 88
Standardization 88
Articulation of high school and college 89
College entrance requirements 89
Entrance examinations 90
Curriculum 90
Special subjects 90
Foreign study 91
Degrees 92
School government:
Legislation, laws—
United States 92
District of Columbia 92
Illinois 92
Kentucky 93
Maryland 93
Massachusetts 93
New York 93
Ohio 93
Pennsylvania 93
Texas 93
Virginia 94
Wisconsin 94
England 94
France 94
Germany 95
Italy 95
Administration—*a*. Supervision and organization 95
National education office 97
Teachers' salaries and pensions 97
School reports; educational statistics 98
School-book question 98
Centralization of rural schools 98
Administration—*b*. Management and discipline 99
Rewards and punishment 99
Recreation 99
Classification and grading 99
Promotion 100
Retardation of pupils 100
Attendance; truancy 100
Self-government 101
School architecture and equipment 101
College architecture 102
Ventilation and lighting 102
Cleaning and disinfecting 102
Schoolroom decoration 102

Digitized by Google

School government—Continued. Page.
School hygiene 102
Medical inspection of schools 104
Contagious diseases 105
Feeding of school children 105
Special subjects—
Eyes and ears 105
Teeth 105
Tuberculosis 105
Miscellaneous 106
Open-air schools 106
School gardens 106
Playgrounds, parks, etc 107
Physical training 108
Public schools 109
Colleges 109
Special days (Arbor day, Bird day, Flag day, etc.) 110
Student life and customs 110
College fraternities 111
High-school fraternities 111
Education—Special forms, relations, and applications:
I. Forms—
Self-education 111
Private-school education 111
II. Sociological aspect of educations—
Education and society; citizenship 111
Education and life 112
Schools as social centers 112
Home and school 112
Child welfare; child labor and education 114
III. Moral and religious education—
General 115
Moral education 115
Religious education 116
Universities 117
The Sunday school 118
Church and education 118
Denominational schools 119
Y. M. C. A 119
International conciliation 119
IV. Types of education—
Humanistic education 120
Vocational education 120
Manual training 121
Industrial and trade education 123
Public school 126
Technical education 127
Agriculture 128
Domestic science 130
Professional education (professions and occupations)—
Architecture 130
Commerce and industry 130
Engineering 131
Fine arts 131

Digitized by Google

Education—Special forms, relations, and applications—Continued. Page.
IV. Types of education—Continued.
Professional education (professions and occupations)—Continued.
Law.... 132
Medicine.... 132
Training of nurses.... 133
Music.... 134
Theology.... 134
V. Education of women.... 134
Coeducation.... 136
VI. Special classes of persons—
Indians.... 136
Negroes.... 136
Orientals.... 137
Immigrants and children of immigrants.... 137
The destitute (orphans, outcasts, paupers, etc.).... 137
The blind.... 137
The deaf.... 138
Crippled children.... 139
Backward children.... 139
Mentally defective children.... 140
Morally defective truants, etc.... 141
Education of royalty.... 141
VII. Education extension—
Continuation schools.... 141
Evening schools.... 141
Summer schools.... 141
University extension.... 141
Libraries in education.... 142
Universities, colleges, etc.:
United States—
University of Arkansas.... 143
Barnard college.... 143
Brown university.... 143
Central high school, Philadelphia.... 143
Cornell university.... 144
Dartmouth college.... 144
Harvard university.... 144
Massachusetts institute of technology.... 144
Miami university.... 144
New York university.... 144
Oberlin college.... 144
Rose polytechnic institute.... 144
Vassar college.... 144
Wesleyan university.... 145
Williams college.... 145
Yale university.... 145
Great Britain—
Cambridge university.... 145
Edinburgh university.... 145
Eton college.... 145
University of Glasgow.... 145
Haileybury college.... 146
National university of Ireland.... 146

Digitized by Google

Universities, colleges, etc.—Continued.
Great Britain—Continued. Page.
Oxford university 146
St. Paul's school 147
University college school, Hampstead 147
Austria—
University of Vienna 147
Belgium—
University of Brussels 147
University of Louvain 147
France—
University of Paris 147
Germany—
University of Leipzig 148
Italy—
University of Bologna 148
India—
University of Calcutta 148
Egypt—
University of Cairo 148
Author and subject index 149

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BIBLIOGRAPHY OF EDUCATION FOR 1909–10

INTRODUCTION

The bibliography of education for 1909–10, as was its immediate predecessor in the series, has been compiled in the library division of the Bureau of Education, which has been aided, in completing the principal sections of the list, by criticisms and additions furnished by prominent educational specialists. In addition to these collaborators in special classes, the entire bibliography, in its preliminary form, was submitted for revision and additions to the librarians of two of the leading pedagogical collections in the country outside of Washington.

A period marked by extensive and excellent literary productivity in education, namely, that reaching from July 1, 1909, to June 30, 1910, falls within the scope of this bibliography, but for special reasons a few important titles published earlier or later than these dates have been included.

The aim has been to present a thoroughly representative selection from the main classes of educational literature published in English during this period. Of publications in foreign languages, those which were judged to have special significance for American educators have been mentioned.

It is believed that the list here given of current proceedings and reports of educational associations will be found especially comprehensive. References have also been made to a considerable number of State and city school documents of importance appearing during the year. Wherever found desirable and practicable, descriptive and critical annotations, either original or quoted from authoritative reviews, have been appended to the titles of books or articles.

A detailed outline of the classification, which, with a few variations, follows that of the Library of Congress for Class L, Education, may be found in the table of contents.

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BIBLIOGRAPHY OF EDUCATION, 1909–10

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Contains: 1. John Dewey: Science as subject-matter and as method (in full, Science, n. s. 31: 121–27, January 28, 1910; Journal of education, 71: 395–96, 427–28, 454, April 14, 21, 28, 1910). 2. E. L. Thorndike: A scale for the measurement of educational facts. 3. C. H. Judd: Experiments in education. 4. G. H. Mead: The psychology of social consciousness implied in instruction (in full, Science, n. s. 31: 688–93, May 6, 1910). 5. W. F. Dearborn: Problems in the psychology of reading. 6. W. C. Ruediger: Qualities of merit in teachers. 7. E. C. Sage: Geographical location and sphere of influence of colleges in the United States. 8. G. D. Strayer: Statistics of student body in American colleges. 9. C. F. Birdseye: The work of the Higher education association (in full, Science, n. s. 31: 721–28, May 13, 1910). 10. E. L. Thorndike, chairman: Report of Committee on collegiate education (Science, n. s. 31: 428–31, March 18, 1910). 11. W. H. Burnham: The group as a stimulus to mental activity (in full, Science, n. s. 31: 761–67, May 20, 1910). 12. E. L. Stevens: Why do pupils leave the high school before graduation?

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74. **American association of farmers' institute workers.** *See* 1396.

75. **American association to promote the teaching of speech to the deaf.** *See* 1508.

76. **American federation of arts.** *See* 1430, 1431.

77. **American home economics association.** *See* 1414.

78. **American institute of instruction.** Papers read at a meeting held at Castine, Maine, July 6, 1909. Journal of education, 70 : 87–97, 102–4, July 22, 1909.

Contains: 1. H. C. Morrison: Federation of New England educational associations, p. 87–89. 2. T. F. Harrington: The health of school children, p. 89–90. 3. H. E. Bates: Co-operation in education, p. 91. 4. John Golden: The educational need from the viewpoint of organized labor, p. 91–92. 5. Julius Tuckerman: Symbols and substance in modern language teaching, p. 92–93. 6. F. B. Jenks: Practical agriculture in rural schools, p. 93–94. 7. W. E. Mason: Children's gardens, p. 94–95. 8. H. P. Waterman: Some results of industrial teaching, p. 95–96. 9. A. C. Boyden: Report on the organization, courses, and methods of some normal schools of the Middle West, p. 96–97. 10. J. E. Mowry: Essentials of arithmetic below the high school, p. 97, 102. 11. W. E. Russell: The problem of industrial education in the normal schools, p. 102–3. 12. G. H. Whitcher: Industrial education in an ordinary high school, p. 103–4.

79. **American nature-study society.** *See* 602.

80. **American school hygiene association.** *See* 1045.

81. **American school peace league.** *See* 1279.

82. **American society of superintendents of training schools for nurses.** *See* 1452, 1453.

83. **Association of American agricultural colleges and experiment stations.** *See* 1397.

84. **Association of American law schools.** *See* 1436.

85. **Association of American medical colleges.** *See* 1440.

86. **Association of American universities.** *See* 793.

87. **Association of colleges and preparatory schools of the middle states and Maryland.** *See* 794.

88. **Association of colleges and preparatory schools of the southern states.** *See* 795, 796.

89. **Association of collegiate alumnae.** *See* 1463.

90. **Association of cosmopolitan clubs.** *See* 900, 901.

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92. **Catholic educational association.** Report of the proceedings and addresses of the sixth annual meeting, Boston, Mass., July 12–15, 1909. Bulletin, v. 6, no. 1, November, 1909. [Columbus, O.] Catholic educational association, 1909. 477 p. 8°. (Rev. F. W. Howard, secretary-general, 1651 East Main st., Columbus, O.)

Contains: 1. E. F. X. McSweeney: Coordination of colleges to seminaries, p. 103–15. 2. F. A. Purcell: The Latin curriculum in our Catholic colleges, p. 167–84. 3. D. J. McHugh: Physical sciences in Catholic colleges, 187–204. 4. M. R. McCarthy: Catholic centers for the deaf in New York and New Jersey, p. 409–14.

93. **Child conference for research and welfare.** *See* 491.

94. **Classical conference.** *See* 1286.

95. **Conference for education in the South.** Proceedings of the twelfth conference, Atlanta, Georgia, April 14–16, 1909. Nashville, Tennessee, The Executive committee of the Conference [1909] 235 p. 8°. (Wickliffe Rose, secretary, Nashville, Tenn.)

Contains: 1. Hoke Smith: Address of welcome, p. 12–17. 2. R. C. Ogden, president: Address, p. 17–29. 3. S. C. Mitchell: The American spirit in education, p. 29–35. 4. J. M. Pound: Educational progress of the year in the sou[illegible] states, p. 36–60. 5. G. B. Cook: The agricultural and in-

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dustrial educational movement in the South, p. 69–84. 6. E. E. Brown: The national program in education, p. 84–97. 7. Clarence Ousley: The educational campaign in Texas, p. 98–111. 8. J. L. Coulter: Economic organization of rural life, p. 112–29. 9. Gifford Pinchot: National progress in country life, p. 129–31. 10. Mrs. B. B. Munford: The southern woman's work for education; a record and interpretation, p. 132–39. 11. Lilian W. Johnson: The woman's club as a factor in education, p. 139–44. 12. Mrs. R. E. Park: The educational work of the club women of Georgia, p. 144–48. 13. Lida S. King: The higher education of women, p. 149–56. 14. C. L. Coon: Public taxation and the negro school, p. 157–67. 15. A. C. Ellis: Education and economic development, p. 171–86. 16. C. R. Van Hise: The state university in the service of the state, p. 186–97. 17. P. P. Claxton: A school for grown-ups, p. 198–203. 18. J. Y. Joyner: How the Southern education board has helped and can help the South, p. 209–13.

96. **Conference for education in the South.** Proceedings of the thirteenth conference, Little Rock, Arkansas, April 6, 7, 8, 1910. Washington, D. C., The Executive committee of the Conference [1910] 352 p. 8°. (P. P. Claxton, secretary, Knoxville, Tenn.)

Contains: 1. G. W. Donaghey: Address of welcome, p. 9–11. 2. R. C. Ogden, president: Address p. 12–30. 3. L. D. Harvey: The training of girls for the home, p. 31–48. 4. J. N. Powers: Report of the year's progress in public education in each of the southern states, p. 50–63. 5. C. A. Cobb: What one southern county agricultural high school has done and is doing, p. 64–69. 6. J. Y. Joyner: The adjustment of the rural school to the conditions of rural life as observed in the rural schools of Page county, Iowa, p. 69–76. 7. J. D. Eggleston, *jr.*: Consolidation by transportation, p. 76–92. 8. T. H. Harris: Unifying the county school system, p. 93–100. 9. A. M. Soule: Education for efficiency in rural communities, p. 101–29. 10. R. E. Blackwell: The function and the future of the small college in the South, p. 129–44. 11. R. H. Lewis: Education and the public health, p. 145–59. 12. H. F. Cope: Religion and education, p. 160–63. 13. W. R. Hollowell: Social improvement leagues; what they are doing and what they may do, p. 164–73. 14. Mrs. T. P. Murrey: The work of school improvement in Arkansas, p. 173–76. 15. Mrs. J. Fletcher: What club women are doing for schools in Arkansas and what they may do, p. 176–80. 16. H. T. Bailey: Community improvement through the school-home, p. 180–85. 17. R. L. Owen: The conservation of our national vitality, p. 190–95. 18. J. C. Branner: Education for economic efficiency, p. 196–209. 19. H. L. Russell: What education is doing for Wisconsin, p. 210–15. 20. F. L. Stevens: Agriculture in the elementary school, p. 219–24. 21. J. J. Doster: Agriculture in public high schools, p. 225–33. 22. C. A. Keffer: What the college of agriculture can do to promote the teaching of agriculture in the rural schools, p. 233–42. 23. D. B. Johnson: Agriculture in normal schools, p. 242–50. 24. C. S. Barrett: America's destinies and the education of the farmer, p. 250–53. 25. S. A. Knapp: How can the masses be induced to adopt a better system of agriculture? p. 253–58. 26. R. C. Stearnes: An excursion among western schools, p. 291–98. 27. J. N. Powers: County schools of agriculture and domestic science in Wisconsin and what they mean to the people, p. 298–301. 28. H. C. Gunnels: Boys' corn clubs, p. 301–4. 29. G. B. Cook: Development and significance of industrial cooperation, p. 304–8. 30. J. G. Crabbe: A great university in the service of the people—seed selection, p. 308–16.

97. **Conference for the study of the problems of rural life.** *See* 547, 548.

98. **Conference on agricultural science.** *See* 1398.

99. **Eastern association of physics teachers.** *See* 724–726.

100. **Eastern manual training association.** *See* 1312, 1432.

101. **Lake Mohonk conference of friends of the Indian and other dependent peoples.** *See* 1488.

102. **Lake Mohonk conference on international arbitration.** *See* 1280.

103. **National association for the study and education of exceptional children.** *See* 1525.

104. **National association of state universities.** *See* 797.

105. **National child labor committee.** *See* 1200.

106. **National conference on the education of backward, truant, and delinquent children.** *See* 1526.

107. **National education association of the United States.** Journal of proceedings and addresses of the forty-seventh annual meeting, held at Denver, Colo., July 3–9, 1909. Winona, Minn., The Association, 1909. xi, 1027 p. 8°. (Irwin Shepard, secretary, Winona, Minn.)

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General session

Contains: 1. L. D. Harvey: The need, scope, and character of industrial education in the public-school system, p. 49–70. 2. Laura D. Gill: The scope of the department of women's organizations, p. 70–75. 3. N. M. Butler: The call to citizenship, p. 75–82. 4. J. W. Abercrombie: Ethics in civic life, p. 83–88. 5. W. F. Gordy: Education and the petition to the third Hague conference, p. 88–91. 6. J. W. Robertson: The Macdonald college movement, p. 92–100. 7. E. G. Dexter: Educational progress in Porto Rico, p. 100–4. 8. N. M. Butler: In memoriam: Dr. James Hulme Canfield, p. 105–7. 9. H. B. Favill: Should the public school be the bulwark of public health? p. 107–18. 10. J. E. Burke: Hygiene in the Boston public schools, p. 118–23. 11. Ben Blewett: The department of school hygiene in the St. Louis public schools, p. 123–29. 12. C. W. Barnes: Moral training through the agency of the public schools, p. 129–40. 13. F. C. Sharp: Some experiments in moral education, p. 141–46. 14. B. B. Lindsey: Childhood and morality, p. 146–57.

Department of Superintendence (Chicago meeting, 1909)

15. J. B. Richey: What is possible and desirable in the simplification of the elementary school course?—the next step, p. 165–68. 16. J. L. Meriam: Fundamentals in the elementary school curriculum, p. 169–75. 17. W. R. Siders: In class instruction, how can the individual be reached? p. 175–82. 18. J. M. Greenwood: Retardation of pupils in their studies and how to minimize it, p. 182–92. 19. S. D. Brooks: The relations of the university to the secondary school, p. 192–98. 20. R. J. Aley: Articulation of higher and secondary education through teaching and teachers, p. 198–203. 21. C. E. Chadsey: The relation of the high school to the community and to the college, p. 203–7. 22. C. P. Cary: Proposed changes in the accrediting of high schools, p. 207–12. 23. W. E. Chancellor: Some personal relations of college and university in this democracy, p. 212–17. 24. Bert Hall: Truancy: a few causes and a few cures, p. 217–22. 25. Julia Richman: What share of the blame for the increase in the number of truants and incorrigibles belongs to the school, p. 222–32. 26. A. D. Call: Moral enthusiasm in the making, p. 232–38. 27. Ella L. Cabot: Moral training in schools, p. 239–45. 28. W. L. Tomlins: Music as a moral influence, p. 245–48. 29. J. W. Abercrombie: The American peril, p. 248–52. 30. W. H. Maxwell: The necessity for departments of health within boards of education, p. 252–57. 31. G. E. Johnson: The playground as a factor in school hygiene, p. 257–62. 32. Woods Hutchinson: The evil influences of school conditions upon the health of school children, p. 262–66. 33. Frank Allport: A plea for the systematic annual and universal examination of school children's eyes, noses, and throats, p. 266–70. 34. K. L. Butterfield: The dignity of vocation as a fundamental idea in industrial education, p. 273–77. 35. Eugene Davenport: Industrial education a phase of the problem of universal education, p. 277–88. 36. E. E. Brown: Industrial education as a national interest, p. 288–90. 37. J. D. Burks: Getting our bearings on industrial education, p. 291–96. 38. J. W. Withers: The functions of the city training school, p. 296–307. 39. David Felmley *and* V. L. Roy: Is the employment of untrained teachers the cause or result of low salaries? p. 307–10. 40. E. E. Brown: The reorganization of the library of the Bureau of education with a view to making it an agency for effective cooperation with pedagogical libraries throughout the country, p. 310–12. 41. O. I. Woodley: Industrial education, p. 312–16. 42. A. C. Thompson: Conditions which demand industrial training in elementary schools, p. 316–17. 43. J. M. Frost *and* C. B. Gibson: Industrial training in high schools, p. 317–22. 44. M. C. Potter: Qualifications and functions of the ward-school principal, p. 322–24. 45. B. E. Nelson: How can the ward-school principal be of most service? p. 324–26. 46. H. V. Hotchkiss: The problem of slow pupils—how to handle them in elementary grades, p. 326–29. 47. E. S. Dreher: Slow pupils in the high school, p. 330.

National Council of Education

48. C. G. Pearse: The care of the deaf and blind in the public schools of Milwaukee, p. 343–46. 49. Olive Jones: The systematic care of the exceptional child, p. 346–50. 50. F. G. Bruner: Abnormal children—their classification and instruction, p. 350–55. 51. Ben Blewett: Provision for exceptional children in the public schools of St. Louis, p. 355–60. 52. S. D. Brooks: Provisions for exceptional children in the public schools of Boston, p. 361–64. 53. L. H. Gulick: The next step in the investigation, p. 365. 54. J. M. Greenwood: The home and school life, p. 367–68. 55. J. H. Baker: Report of progress by the committee on the culture element and economy of time in education, p. 373–76. 56. W. H. Smiley: The need of an investigation of the culture element and economy of time in education as related to secondary schools, p. 377–80. 57. A. S. Downing: The meaning of industrial education to the elementary schools, p. 380–85. 58. E. E. Brown: Report of committee on cooperation with educational organizations in other countries, p. 388–90. 59. J. W. Cook: The progress of education for the year, p. 390–97. 60. N. C. Schaeffer: The supervision of rural schools, p. 397–400. 61. E. G. Cooley: The adjustment of the school system to the changed conditions of the twentieth century, p. 404–10. 62. H. H. Seerley: The province of the common people in the administration of public education, p. 415–21. 63. E. T. Fairchild: The province of State boards and State superintendents in the administration of public education, p. 423–26. 64. C. H. Keyes: The function of county and city boards and superintendents in school administration, p. 426–29. 65. W. O. Thompson: The province of State educational institutions in the administration of public education, p. 430–33.

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Department of Kindergarten Education

66. E. E. Brown: The preparation of the kindergarten for institutional life, p. 438–39. 67. F. B. Dyer: The place of the kindergarten in the public school, p. 439–40. 68. G. M. Forbes: The function of the kindergarten in the public school, p. 440–45. 69. Alma O. Ware *and* Alma L. Binzel: To accord with modern educational ideals, what further modification or reconstruction of the handwork of the kindergarten and elementary grades should be made? p. 445–55.

Department of Elementary Education

70. J. F. Chamberlain: Progress and needs in elementary education, p. 458–60. 71. J. W. Cook: Does the curriculum of the elementary school meet the existing needs? p. 460–65. 72. H. B. Work: How can the curriculum of the elementary school be enriched? p. 466–71. 73. O. W. Caldwell: The place and practice of nature study in the elementary school, p. 471–73. 74. Ellen H. Richards: Application of the household arts and sciences in the elementary schools, p. 473–76.

Department of Secondary Education

75. J. S. Brown: The autonomy of the high school, p. 480–85. 76. Eugene Davenport: Unity in education and its preservation while meeting the demands for industrial training, p. 485–92. 77. F. H. Hall: The ethical value of vocational instruction in secondary schools, p. 492–97. 78. G.B. Morrison: Third report of the committee on six-year course of study, p. 498–503. 79. Gilbert Random: The recent movement in physics, p. 503–7. 80. V. K. Froula: The scope and value of history in the high school, p. 507–11. 81. H. L. Rietz: An exposition of the Illinois syllabus on algebra for secondary schools, p. 511–14. 82. E. B. Hedrick: The treatment of geometry for secondary instruction, p. 515–19. 83. J. F. Millis: The real-problem movement in its relation to the teaching of geometry and algebra in secondary schools, p. 519–22.

Department of Higher Education

84. A. R. Hill *and* S. W. Williston: Has the American college failed to fulfill its function? p. 523 33. 85. Charles Fordyce *and* J. H. T. Main: How to develop properly the inner community life of the college or university, p. 535–46.

Department of Normal Schools

86. H. G. Williams: The place of the normal school in a system of public education, p. 548–56. 87. S. E. Harwood: The training school as a school of observation and practice, p. 557–61. 88. C. B. Robertson: The functions of the training school: its relations to the department of principles and methods, p. 561–67. 89. H. H. Seerley: The Davis bill in its relation to normal schools, p. 570–73, 90. Albert Salisbury: Teacher-training in Great Britain, p. 573–79. 91. D. McGregor: Professional training for teachers of secondary schools, p. 581–87. 92. T. A. Hillyer: Professional training for teachers of secondary schools in colleges and universities, p. 587–92. 93. A. O. Thomas: Who should determine standards and courses for the training of teachers, and how should such standards be determined? p. 592–96.

Department of Manual Training

94. J. E. Addicott: Definitions pertaining to industrial arts, p. 599–606. 95. J. C. Monaghan: From the standpoint of economic and manufacturing interests, should special trade schools be established? p. 606–13. 96. A. B. Clark: Art as related to the industries: from standpoint of art, p. 616–21. 97. Ednah A. Rich: Art from standpoint of manual training, p. 621–24. 98. A. H. Chamberlain: [Art] from general educational standpoint, p. 624–28. 99. C. T. Work: The importance of instruction in arts and sciences for home life, p. 628–36. 100. Ellen H. Richards: Influence of industrial arts and sciences upon rural and city home life: from the standpoint of domestic science, p. 636–39. 101. Albert Salisbury: Influence of industrial arts and sciences, etc.: from the standpoint of economic interests, p. 640–43.

Department of Art Education

102. Florence E. Ellis: Better preparation for the life needs of the great majority who do not reach the high school, p. 646–49. 103. Gertrude R. Smith: Art in the home, p. 649–54. 104. C. M. Carter: The international congress of art in London, p. 655–60. 105. W. H. Elson: A course of study in freehand drawing and applied arts, p. 660–64. 106. A. B. Clark: Report of committee on university entrance examinations in art, p. 667–69. 107. Henry Read: The American federation of arts, p. 669–72.

Department of Music Education

108. Frances E. Clark: The status of music in the United States, p. 675–81. 109. C. H. Farnsworth. Music on an accredited basis in colleges and universities, p. 681–87. 110. W. G. Chambers: Modern psychology and music study, p. 687–91. 111. C. I. Rice: Report of committee on terminology, p. 691–95. 112. E. E. Brown: Our national songs, p. 695–96. 113. J. R. Kirk: Music on an accredited basis, p. 696–99.

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Department of Business Education

114. S. R. Hoover: The next advance movement, p. 702–4. 115. H. M. Rowe: The university of commerce: what it should teach and why, p. 705–11. 116. J. J. Sheppard: High school of commerce or commercial department? p. 712–15. 117. Elizabeth Van Sant: Possibility or desirability of a national uniform system of stenography, p. 716–18.

Department of Child Study

118. W. G. Chambers: Why children play, p. 720–26. 119. O. R. Lovejoy: The child in industry, p. 726–33. 120. J. H. White: The child in the group, p. 733–37. 121. B. B. Lindsey: The child and the community, p. 737–43.

Department of Physical Education

122. W. W. Hastings: The place of physical education in the field of hygiene, p. 746–51. 123. G. W. A. Luckey: Should school hygiene become a department of the public-school system and physical training be made a subdepartment under school hygiene? p. 751–56. 124. W. E. Garrison: The proper balance between mental and muscular training in the school curriculum, p. 759–64. 125. W. F. Slocum: Athletic competition in college and preparatory school, or competition preparatory to entering college, p. 765–69. 126. C. E. Chadsey: The proper relation of organized sports on public playgrounds and in public schools, p. 771–77. 127. John Dietrich *and* E. C. Bishop: How should the athletics of both men's and boys' departments of the Y. M. C. A. supplement that of the public schools? p. 777–85.

Department of Science Instruction

128. O. W. Caldwell: The modern high school and industrial education, p. 790–94. 129. E. J. Townsend: The status of the high school and its relation to colleges and universities, p. 794–99. 130. G. A. Cowen: The aim and methods of science education in secondary schools, p. 799–801. 131. W. N. Clifford: Report of the committee on the topic: The United States Government materials that are usable in secondary education, p. 802–3. 132. H. A. Winkenwerder: Progress in conservation, p. 803–9. 133. C. E. Peet: What shall the first-year high-school science be? p. 809–15. 134. R. O. Johnson: The course in elementary-school science and its relation to high-school science, p. 817–20. 135. J. F. Chamberlain: Report of the committee on secondary-school geography, p. 820–28.

Department of School Administration

136. L. E. Wolfe: Progress in school administration, p. 830–33. 137. C. F. Perry: Trade schools and school boards, p. 833–39. 138. C. W. Mark: The function of school boards, p. 839–42.

Library Department

139. R. J. Aley: Books and high-school pupils, p. 844–48. 140. Edith Tobitt: Plan of a course of instruction in the use of libraries, and the results accomplished, p. 848–52. 141. F. G. Blair: The study and use of books, p. 852–58. 142. C. E. Chadsey: What does each, the library and the public school, contribute to the making of the educated man? p. 860–63. 143. J. E. Banta: The library and the school, p. 863–70.

Department of Special Education

144. C. G. Pearse: Public schools for the exceptional child, p. 873–77. 145. A. O. Neal: The Indiana plan for handling truants, indigent and pauper children, p. 877–85. 146. L. E. Milligan: The industrial education of the deaf, blind, and feeble-minded, p. 885–89. 147. E. M. Van Cleve: The outlook for the blind youth, p. 889–94. 148. Ida H. Clark: Open-air schools, p. 894–901. 149. F. G. Bruner: Report of committee on books and tests pertaining to the study of exceptional and mentally deficient children, p. 901–14.

Department of Indian Education

150. C. E. Burton: A résumé of Indian work, p. 917–18. 151. J. F. Murphy: The prevention of tuberculosis in the Indian schools, p. 919–24. 152. J. H. Baker: Our educational duties to the Indian, p. 927–28. 153. C. B. Dyke: Essential features in the education of the child races, p. 928–32. 154. S. L. Heeter: The teacher's responsibility to the Indian child, p. 932–35. 155. J. H. Phillips: Character-building: the foundation of education, p. 936–38. 156. H. B. Peairs: What education has done for the Indian, p. 938–40. 157. B. B. Lindsey: Moral training, p. 940–45. 158. A. J. Fynn: The preservation of aboriginal arts, p. 947–50. 159. S. T. Sherry: Elementary industrial training in the day school, p. 950–52.

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Department of Rural and Agricultural Education

160. S. A. Knapp: Agricultural education for the rural districts, p. 954–58. 161. E. E. Balcomb: Some means of awakening and maintaining an interest in agricultural education, p. 959–64. 162. H. H. Scerley: National aid in the preparation of teachers of agriculture for the public schools, p. 965–68. 163. D. J. Crosby: How may the rural schools be more closely related to the life and needs of the people, p. 969–71. 164. D. J. Crosby: Special agricultural high schools, p. 974–76. 165. E. C. Bishop: The present status of agricultural education in the public schools, p. 976–82. 166. Josiah Main: The correlation of high-school science and agriculture, p. 983–87. 167. R. O. Johnson: Agriculture for the elementary schools, p. 987–92.

Department of Women's Organizations

168. Helen L. Grenfell: The constitution of the ideal school board, and the citizen's duty toward it, p. 994–99. 169. J. A. Bache: Delinquency and the responsibility of the school toward it, p. 1001–6. 170. Theda Gildemeister: Study at home, p. 1009–12. 171. Mrs. H. J. Hersey: The parents' obligation to the school p. 1012–16.

108. **National education association of the United States. Department of superintendence.** Proceedings of annual meeting held at Indianapolis, Ind., March 1–3, 1910. [Winona, Minn.] The Association, 1910. 179 p. 8°.

Contains: In memoriam—William Torrey Harris, by George P. Brown, Charles P. Cary, and Elmer Ellsworth Brown. Discussion of the following topics: Differences of children in mental alertness, moral responsibility, mental attitudes, tastes and tendencies, physical condition, environment, vocational aim; The country child; Purpose and content of the elementary curriculum; Grading and promotion of pupils.

109. **National society for the promotion of industrial education.** *See* 1337.

110. **National society for the study of education.** *See* 1065.

111. **National society of college teachers of education.** *See* 785.

112. **Playground association of America.** *See* 1112.

113. **Religious education association.** *See* 1232.

114. **Society for the promotion of engineering education.** *See* 1428.

115. **Southern association of college women.** *See* 1465.

116. **Southern educational association.** Journal of proceedings and addresses of the nineteenth annual session, held at Atlanta, Georgia, December 29–31, 1908. [Chattanooga, Tenn.] The Association [1909] 736 p. 8°. (William F. Feagin, secretary, Montgomery, Ala.)

Contains: 1. M. L. Brittain: The rural school house, p. 59–62. 2. P. P. Claxton: A review, a condition, a task, p. 85–90. 3. H. S. West: A formula for method in high school English literature, p. 91–97. 4. Nettie C. Sergeant: Theme writing in the high school, p. 98–106. 5. F. L. Riley: History in the high school, p. 107–15. 6. T. J. Jones: Relation of the state to the education of the negro, p. 116–20. 7. J. H. Phillips: Essential requirements of negro education, p. 121–29. 8. J. H. Dillard: Negro rural schools, p. 130–35. 9. C. F. Meserve: Results of attempts at the higher education of the negro of the South, p. 136–44. 10. C. J. Owens: Agricultural education in the United States, p. 149–56. 11. C. B. Gibson: Recent tendencies towards industrial education in Europe and America, p. 157–66. 12. Julia T. Rankin: Trained librarianship in the South, p. 167–73. 13. R. J. Tighe: Compulsory school attendance in Asheville, N. C., p. 174–80. 14. Emma G. Boyd: Compulsory education, p. 181–83. 15. Wickliffe Rose: Education as a public business, p. 184–90. 16. J. C. Olmstead: Medical inspection of school children for contagious and infectious diseases, p. 200–5. 17. Dunbar Roy: Necessity for proper care of school children's eyes and ears, p. 206–18. 18. C. E. Boynton: Education of the backward child—a psychological study, p. 219–25. 19. W. B. Murrah: Right views of education, p. 226–34. 20. H. L. Smith: A conspicuous fault in modern university training, p. 235–40. 21. C. W. Needham: The university's service to the state, p. 241–52. 22. W. W. Smith: Student self-government, p. 253–58. 23. R. P. Pell: The college professor and the community, p. 259–67. 24. A. P. Montague: The teacher's place in the American commonwealth, p. 268–72. 25. E. M. Poteat: The denominational college, p. 273–78. 26. P. H. Mell: College attitude toward the high school, p. 279–82. 27. J. P. Monaghan, S. J.: True aim in scientific education, p. 283–306. 28. J. E. Allen: Status and dignity of secondary education in the South, p. 310–24. 29. John Graham: Relation of the high school to the state and college, p. 325–27.

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30. T. P. Scott: Two-fold function of the high school, p. 328–35. 31. Wallace Townsend: The high school as a factor in the community, p. 336–46. 32. W. E. Miller: The high school as a preparation for life work, p. 347–59. 33. J. P. W. Brouse: Individuality of the high school, p. 360–65. 34. R. A. Wells: Why are the public schools so severely criticised? p. 366–80. 35. G. W. Lay: Intelligent and honest standards in secondary education, p. 381–90. 36. I. W. Jayne: A high school for the country boy and girl, p. 391–98. 37. C. L. Coon: A suggestion to promote rural high school development, p. 399–401. 38. William Schuyler: The so-called culture studies in secondary education—some questions, p. 402–5. 39. P. R. Radcliffe: Aims of the recitation, p. 406–12. 40. J. R. Powell: Rational high school course of study for modern complex conditions, p. 413–21. 41. R. H. Jordan: Some advantages of a group system of electives in a high school course of study, p. 422–29. 42. B. C. Caldwell: Relation of the model, practice, or training school to the work of the normal school, p. 435–39. 43. J. L. Jarman: Relation of heads of departments to supervisors or critic teachers, p. 440–44. 44. H. H. Cherry: Democracy and education, p. 445–50. 45. R. J. Tighe: Women's clubs in cooperation with the public schools, p. 453–58. 46. M. A. Cassidy: Use of school buildings and grounds aside from regular school sessions, p. 459–62. 47. E. L. Hughes: Supervision of negro schools, p. 463–69. 48. L. M. McCartney: Efficiency of teachers, p. 470–74. 49. G. G. Bond: Evolution of pedagogy, p. 475–81. 50. P. W. Horn: Relation of the city schools to the commission form of city government, p. 482–90. 51. I. C. McNeill: The delinquent child, p. 491–98. 52. C. B. Chapman: What is the hope of compulsory education in the elementary schools? p. 508–13. 53. J. H. Reynolds: Agricultural high schools, p. 515–25. 54. P. A. Hopkins: Relation of manual training to the technical school, p. 526–29. 55. J. C. Mattoon: Common schools from an industrial standpoint, p. 530–40. 56. M. T. Fullan: Advantages of the trade school over the apprenticeship system, p. 541–50. 57. E. C. Emerson: The large project vs. the small model, p. 551–54. 58. Marion L. Baskin: Educational value of gymnastics, p. 567–74. 59. Ellen Reiff: Construction work in relation to mind growth, p. 617–21. 60. Lillian Rule: Handwork in the first four years of school, p. 622–28. 61. G. H. Baskette: The library as a factor in education, p. 641–45. 62. J. N. Deahl: Value of child study for parents, p. 649–52. 63. Maude M. Shipe: Play the legitimate business of childhood, p. 653–60. 64. H. J. Pearce: Interrelation of suggestibility and intelligence p. 665–71. 65. Max Meyer: A neglected method of examination, p. 672–77. 66. W. T. White: Some mentally defective children in our public schools, p. 678–82. 67. W. I. T. Hoover: Psychology in secondary education, p. 683–86. 68. Miss C. P. Oppenheimer: Relation of the kindergarten to the home, p. 695–700.

117. **Western drawing and manual training association.** *See* 1313, 1314.

118. **Women's educational and industrial union.** *See* 1466, 1467.

ASSOCIATIONS, SOCIETIES, CONFERENCES, ETC.—STATE AND LOCAL

119. **Alabama educational association.** Official proceedings of the twenty-ninth annual session, . . . held at Birmingham, March 24–26, 1910. [Birmingham, 1910] 331 p. 8°. (W. C. Griggs, secretary, Birmingham, Ala.)

Contains: 1. N. R. Baker: Present problems, p. 44–54. 2. Toulmin Gaines: Education for health, p. 54–63. 3. Janet C. Simpson: Improvement in teaching, p. 63–68. 4. F. J. Cowart: Consolidation of rural schools, p. 68–72. 5. W. H. Storey: Efficient supervision, p. 72–78. 6. C. B. Glenn: Efficient supervision, p. 79–82. 7. J. Y. Joyner: Address, p. 82–91. 8. H. P. Judson: The teacher and the community, p. 91–96. 9. Mrs. R. D. Johnston: Address, p. 97. 10. Mrs. Martha Gielow: Address, p. 98–100. 11. Sarah Louise Arnold: The teacher's task, p. 100–1. 12. Cora Pearson: Composition in grammar grades, p. 109–11. 13. Mrs. S. J. Price: Grammar in the upper elementary grades, p. 111–15. 14. H. C. Gunnels: Address, p. 116–17. 15. W. H. Storey: Needed changes in the school law, p. 118–22. 16. J. P. Oliver: What can the county superintendent do to increase the interest in the study of agriculture in our schools, p. 122–25. 17. P. B. Hughes: Qualified superintendents, p. 125–28. 18. M. T. Linder: Competent county supervision, p. 128–31. 19. W. T. Hollinsworth: Qualified supervision, p. 132–34. 20. S. R. Butler: Local taxation, p. 134–35. 21. Georgie Wade: Model language lesson, p. 136–39. 22. M. T. Fullan: Industrial education in the new rural school, p. 140–48. 23. Isabel Bevier: Industrial education for girls in the schools, p. 148–50. 24. Annie Walker: The correlation of manual training with other work in primary grades, p. 152–54. 25. H. Reid: Manual training equipment in primary grades, p. 154–55. 26. Maude Green: The use of native materials, p. 155–57. 27. R. L. Dimmitt: High school work in manual training, p. 157–58. 28. Alice Sachs: Music in the schools from a supervisor's viewpoint, p. 160–63. 29. Eva L. Bennett: Should music be compulsory or elective in the normal school, p. 163–65. 30. Maude E. Truitt: How and why should music be made a required state study in the Alabama schools? p. 165–69. 31. T. W. Palmer: Definition of a college, p. 177–80. 32. E. M. Shackelford: Place of normal schools in the state system, p. 180–82. 33. S. M. Hosmer: Intercollegiate athletics in Alabama, p. 182–85. 34. Mrs. P. B. Reed: Education of women in Alabama, p. 185–92. 35. W. R. Harrison: Our high school needs in Alabama, p. 193–95. 36. P. M. McNeil: Relation of the high school to the elementary school, p. 195–98. 37. A. A. Persons: A secondary school laboratory equipment in physics, p. 198–207. 38. L. N. Duncan: Best method of introducing agriculture and allied branches into high schools, p. 207–14. 39. B. B. Broughton: High school

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athletics, p. 215–19. 40. Iralee Whitaker: How I teach my English course, p. 220–22. 41. Lillian Gatlin: The English course in a county high school, p. 222–26. 42. M. A. Bright: Suggestions for teaching the classics, p. 226–31. 43. R. O. Dykes: Geometrical drawing as an aid in the teaching of geometry, p. 231–33. 44. E. S. Pugh: The necessary equipments of the teachers of mathematics, p. 233–35. 45. E. W. Jenkins: How I equipped a chemical laboratory at small cost, p. 235–36. 46. E. S. McClathery: Arrangement and care of laboratories, p. 236–40. 47. J. Y. Graham: Biology in everyday life, p. 240–44. 48. F. E. Lloyd: On the best method of teaching high school botany, p. 244–51. 49. W. B. Suffold: What Latin the high school graduate should know, p. 251–54. 50. J. L. Moulder: Effect of our college entrance requirements on the development of the high school, p. 255–56. 51. J. J. Doster: Statistics of secondary education, p. 256–57. 52. C. H. Barnwell: Admission by certificate, p. 258–62. 53. R. F. Cooper: Functions of the high school as compared with those of the college, p. 262–68. 54. Mrs. E. D. Thames: Presentation of the school improvement movement in Alabama, p. 274–79.

120. **Arkansas state teachers' association.** Proceedings of the forty-second annual session . . . Hot Springs, December 28th, 29th, and 30th, 1909. Little Rock, Ark., 1910. 253 p. 8°. (Henry S. Traylor, secretary, Booneville, Ark.)

Contains: 1. Committee on code of ethics: Report, p. 28–32. 2. H. S. Hartzog: Educational evangelism, p. 36–45. 3. G. B. Cook: The attitude of Arkansas toward public education, p. 46–54. 4. J. J. Doyne: Education for efficiency, p. 55–62. 5. B. W. Torreson: Needs of a higher education, p. 63–65. 6. W. D. Johnson: The Arkansas teachers' reading circle, p. 66–71. 7. G. R. Hopkins: How may we secure more male graduates from the high schools? p. 72–73. 8. B. F. Condray: Should we have a uniform curriculum for high schools in Arkansas? No. p. 74–75. 9. R. J. Nelson: Industrial training—its benefits—how may it be introduced into the public schools? p. 76–78. 10. J. A. Presson: How may the superintendent test the quality of the teacher's work? p. 79–82. 11. F. G. May: How may the superintendent test the quality of the teacher's work? p. 83–85. 12. C. F. Adams: Agriculture in the collegiate and professional worlds, p. 97–101. 13. J. H. Reynolds: Conservation of the soil, p. 102–12. 14. C. C. Denney: The relation that the state normal sustains to the high schools and colleges of the state, p. 116–20. 15. B. W. Torreyson: The high school situation in Arkansas, p. 121–23. 16. W. B. Loudermilk: How to secure more accurate reports from school directors and county examiners, p. 124–30. 17. J. P. Womack: Student self-government, p. 136–38. 18. J. R. Williamson: Student government, p. 139–40. 19. J. C. Futrall: Some defects in the teaching of Latin in the secondary schools, p. 146–51. 20. O. E. Williams: Suitable libraries for the grades; how secured; how preserved; how made useful, p. 168–70. 21. W. J. Sowder: Outline course for agriculture in the graded schools, p. 189–96. 22. Mrs. F. M. Williams: How can the home and the school be brought into closer relations, p. 231–32.

121. **Brown university teachers' association.** Proceedings, 1910. Education, 30: 609–93, June 1910. (Elmer T. Hamer, president, Pawtucket, R. I.)

Contains: 1. W. H. P. Faunce, president: Greeting, p. 609–10. 2. A. A. Holden: Survival of the freshmen in New England colleges, p. 611–15. 3. F. W. Nicolson: College failures: the responsibility of the school and the home, p. 617–31. 4. D. W. Abercromble: The responsibility of the college for the freshman, p. 632–48. 5. C. E. Dennis, jr.: Report of Committee on college entrance requirements, p. 649–60. 6. J. S. French: How to secure from the pupil initiative and independent effort, p. 661–69. 7. S. H. Rowe: The study habit and how to form it, p. 670–83. 8. F. M. McMurry: Relative values in study, and the basis for judging them, p. 684–92. 9. Maud E. Kingsley: Examination questions for Homer's Odyssey, p. 692–93.

122. **California. City and county superintendents.** Proceedings of the first annual convention, held near Yosemite Falls, August 23–28, 1909. Western journal of education, 14: 427–63, September 1909.

Contains: James Ferguson: Commercial education in the United States and abroad, p. 452–63.

123. **California council of education.** Committee on permanent organization. Report, adopted at Fresno, March 12, 1910. Sierra educational news and book review, 6: 35–43, April 1910. (Mark Keppel, secretary, Los Angeles, Cal.)

124. **Conference for education in Texas.** Proceedings of the third annual session, Austin, Texas, March 26–27, 1909. Austin, Austin printing company [1909] 110 p. 8°. (A. N. McCallum, secretary, Austin, Tex.)

Contains: 1. S. E. Mezes, J. L. Kesler: What must be done in order that the people of Texas may enjoy the privileges of an efficient State system of public schools? p. 11–18, 18–31. Discussion (by R. B. Cousins), p. 31–36. 2. D. M. Alexander: The thirtieth legislature in educational history, p. 37–43. 3. M. L. Hurst: The movement for local taxation, p. 44–50. Discussion, p. 50–60.

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4. F. L. Townsend: The farmers' interest in better schools for all the children of the State, p. 62–73. 5. J. S. Austin: The laborers' interest in better schools for all the children of the State, p. 74–79. 6. M. A. Spounts: The property-holders' interest in better schools for all the children of the State, from the standpoint of the railroads, p. 80–85. 7. C. E. Evans: The work of the second year and the program for the third year, p. 86–91. Discussion, p. 91–99. 8. A. C. Ellis: The problem of modern school buildings in Texas, p. 99–109.

125. **Conference for education in Texas. Educational commission.** *See* 922.

126. **Georgia educational association.** Proceedings and addresses of the forty-third annual meeting at Cumberland Island, Ga., June 23, 1909. Waldosta, Ga., Times publishing company, 1909. 65 p. 8°.

Contains: 1. O. B. Martin: Public school extension work, p. 26–35. 2. C. B. Gibson: Waste in education, p. 36–40. 3. Mrs. W. B. Hill: Better educational facilities, p. 49–52. 4. J. I. McCleskey: Consolidation of rural schools, p. 53–58. 5. O. Ashmore: The problem of the slow pupil, p. 59–65.

127. ——— Proceedings and addresses of the forty-fourth annual meeting, Atlanta, Ga., April 28–30, 1910. Macon, Georgia, The Anderson printing co., printers, 1910. 185 p. 8°. (Clifford L. Smith, secretary, 1910–11, La Grange, Ga.)

Contains: 1. E. A. Pound: Causes of failure in teaching, p. 35–47. 2. J. N. Rogers: Agricultural education in the public schools, p. 48–52. 3. D. B. Johnson: Southern ideals: Why they should be maintained in the education of southern women, p. 53–58. 4. K. G. Matheson: Some thoughts concerning the effect of technical education upon the prosperity of the South, p. 59–69. 5. M. L. Duggan: Our rural school problems, p. 70–72. 6. Mrs. F. F. Andrews: The teacher and internationalism, p. 73–80. 7. A. J. Cobb: The needs of secondary schools in Georgia, p. 81–84. 8. G. A. Persons: The needs of secondary schools in Georgia, p. 85–90. 9. J. S. Stewart: The needs of secondary schools in Georgia, p. 91–97. 10. R. B. Daniel: Industrial education in the grammar schools, p. 110–14. 11. D. C. Barrow: Standardization of higher education, p. 115–22. 12. J. F. Sellers: Standardizing our colleges, p. 122–29. 13. H. B. Hunt: The functions of the high school, p. 130–32. 14. A. M. Soule: The functions of the high school, p. 132–39. 15. R. H. Powell, jr.: The function of the college in the preparation of teachers, p. 140–43. 16. E. C. Emerson: The problem of holding the boy in the high school, p. 143–52. 17. K. T. Alfriend: The problem of holding the boy in the high school, p. 152–56. 18. T. H. Garrett: Planning the high school course, p. 157–64. 19. C. L. Smith: The duty of the State to her secondary schools, p. 165–68. 20. G. I. Orr: The teaching of English in elementary schools, p. 169–75. 21. T. J. Woofter, chairman: Report of committee on legislation and the betterment of the profession of teaching, p. 175–79.

128. **High school teachers' association of Los Angeles.** *See* 642.

129. **High school teachers' association of New York city.** *See* 643, 644.

130. **Illinois state teachers' association.** Journal of proceedings of the fifty-fifth annual meeting, held at Springfield, Illinois, December 29–31, 1908. Springfield, Illinois, Illinois state journal co., state printers, 1909. 219 p. 8°.

Contains: 1. F. G. Blair: The educational commission and the school system, p. 36–44. 2. F. H. Hall: The township as the unit of school organization, p. 44–49. 3. E. E. Van Cleve: Effect of proposed legislation upon township high schools, p. 49–51. 4. O. L. Manchester: The work of the educational commission, p. 51–57. Discussion, p. 57–59. 5. J. W. Cook: Memorial address—Richard Edwards, A. M., LL. D., p. 59–68. 6. J. E. Miller: Memorial: Honorable James P. Slade, p. 69–73. 7. R. M. Hitch: Memorial: Homer Bevans, p. 73–76. 8. D. E. Smith: The present tendency in arithmetic, p. 81–95. 9. M. M. Cook: The county superintendent and the proposed new certificate law, p. 114–20. Discussion, p. 120–22. 10. May S. Hawkins: The proposed minimum wage law and the country schools, p. 125–26. 11. G. T. Smith: Certification of teachers, p. 130–34. 12. F. M. Richardson: Minimum wage scale for teachers, p. 134–38. 13. W. C. Bagley: Recent result and tendencies in child study, p. 147–52. 14. F. G. Bonser: Vocational work below the high school in its bearing on the growing ideal interests of children, p. 153–58. 15. J. E. Raycroft: The function and administration of medical supervision in the school, p. 158–63. 16. Ella T. Price: A standard of morals for primary children, p. 167–71. 17. Eva A. Smedley: A standard of morals for primary children, p. 171–74. 18. Helen M. Sabin: The ethical value of handwork, p. 174–78. 19. Anna H. Morse: Kindergarten certificates, p. 178–80. Discussion, p. 180–83. 20. E. A. Turner: The certification of teachers, p. 192–95. 21. C. H. Brittin: The proposed certificating law, p. 200–2.

131. ——— Journal of proceedings of the fifty-sixth annual meeting, held at Springfield, Illinois, December 28–30, 1909. Springfield, Ill., Illinois state journal co., state printers, 1910. 271 p. 8°. (Caroline Grote, secretary, Macomb, Ill.)

Contains: 1. C. M. Bardwell: President's address, p. 66–68. 2. F. G. Blair: Results of the work of the educational commission, p. 68–75. 3. A. E. Winship: The schools and the critics, p. 75–78. 4. D. W. Potts: The relation of motor to mental activity, p. 78–99. 5. David Felmley: The educa-

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tional value of manual training, p. 99-104. 6. F. D. Crawshaw: What to consider in introducing manual training in a school, p. 104-10. 7. Mrs. F. E. Clark: A modern Apollo [school music], p. 122-29. 8. Rabbi Leon Harrison: The gospel of hard work—What hard work does for us: how it educates us, p. 129-34. 9. W. N. Clifford: How forestry can be taught in the school, p. 134-37. 10. U. J. Hoffman: Experiences in standardizing country schools, p. 144-46. 11. E. C. Pruitt: Setting up a definite aim, p. 146-48. 12. D. F. Nickols: Standardization of rural schools—the effect on the teacher, p. 148-50. 13. Leona F. Bowman: Value of country school inspection by the State department to the county superintendent, p. 150. 14. Charles McIntosh: The county institute—State aid, p. 151-54. 15. F. A. Gilbreath: Time of holding annual institutes, p. 155-58. 16. A. F. Nightingale: How to obtain good instructors for institutes, p. 158-62. 17. W. C. Bagley: The possibility of training children how to study, p. 167-73. 18. L. A. Fulwider: A cooperative school and shop course, p. 179-87. 19. J. D. Rogers: The content of the course of study leading to the B. A. degree, p. 188-94. 20. H. B. Wilson: The beginning of medical inspection in Illinois, p. 196-200. 21. E. T. Davies: Enforcement of the law concerning child labor, p. 200-7. 22. Charles Virden: A review of the social and educational agencies for the amelioration of the conditions of childhood now operative in Illinois—finding, placing and supervision of dependent and delinquent children of the State, p. 208-11. 23. Caroline Hedger: Some problems of sanitation in the public schools of Chicago, p. 211-14. 24. E. A. Wygant: Morality taught through plays and games, p. 216-18. 25. M. L. Hood: Morality taught in the general management of the school, p. 218-19. 26. Mrs. J. E. Warren: Practical methods in sight singing, p. 221-23. 27. H. A. Hollister: Character and scope of the work of an accredited high school, p. 225-29. 28. Mrs. O. T. Bright: The aims of the congress of mothers' clubs, p. 230-31. 29. Mrs. W. S. Hefferan: Home training of children, p. 231-33. 30. F. G. Bonser: Where parents fail in the education of children from the school's point of view, p. 233-38. 31. Stuart Brown: Some aspects of school training as viewed by the business man, p. 238-41. 32. F. G. Bonser: What should be the attitude of the normal school toward industrial education? p. 243-50.

132. **Indiana state teachers' association.** Proceedings and papers of the fifty-sixth session, December 28, 29, 30, 1909, Indianapolis, Indiana. [Indianapolis, 1910] 152 p. 4°. (J. B. Pearcy, permanent secretary-treasurer, Anderson, Ind.)

Contains: 1. R. J. Aley: Institutional responsibility, p. 27-30. 2. Symposium: Some needed school adjustments, p. 30-42. 3. J. R. Carr: The rural school: its improvement, p. 55-57. 4. J. W. Figg: Improvement of rural school—patron's part, p. 57-58. 5. Oscar Thomas: What the teacher can do to improve our rural schools, p. 58-59. 6. J. N. Hurty: How the board of health can assist in improving the rural school, p. 59-60. 7. W. W. Black: How the county institute instructor can help the rural school, p. 61-62. 8. W. O. Wilson: The township institute, p. 62-64. 9. R. N. Tirey: County supervision supplementary to visitation, p. 65-67. Discussion, p. 67-68. 10. J. C. Webb: Work of the county board of education, p. 68-70. 11. A. E. Highley: History of the correlation of mathematics, p. 70-71. 12. W. W. Hart: Correlation of mathematics in grade school and high school, p. 71-73. 13. Francis Daniels: The influence of French on English, p. 79-81. 14. E. H. Biermann: Some problems connected with the teaching of German in high schools, p. 82-84. 15. C. B. McLinn: The teaching of poetry in high school, p. 85-87. 16. C. D. Mead: Head, heart, or hand with the deficient child? p. 89-91. 17. H. M. Appleton: Classroom problems for the manual-training teacher, p. 91-93. 18. Laurinda De Vilbiss: Domestic science in the public schools, p. 93-95. 19. L. A. Pittenger: Training of high-school teachers, p. 95-96. 20. J. E. Neff: The academic preparation of the high-school teacher, p. 96-99. 21. T. A. Mott Richmond: Modifications of the work of the seventh and eighth grades, p. 99-101. 22. R. Katharine Beeson: Poetry in the grades; its possibilities for teaching children the common lessons of life, p. 101-2. 23. C. C. Coleman: Greek and Latin as aids to the study of English—a discussion, p. 102-3. 24. D. D. Hains: The theater of the Greeks, p. 103-5. 25. Lulu Williamson: Reading in the first and second grades, p. 105-7. 26. B. F. Moore: Reading in the third and fourth grades, p. 107-9. 27. Anna Boruff: Reading in the fifth and sixth grades, p. 109-10. Discussion, p. 110-11. 28. Blanche Merry: Reading in the seventh and eighth grades, p. 111-12. Discussion, p. 113. 29. H. W. Stopher: Music contests and their effects upon the schools, p. 113-14. 30. W. A. Millis, R. J. Aley: The county institute. p. 115-17. Discussion, p. 117-18.

133. **Iowa state teachers' association.** Proceedings of the fifty-fourth annual session, held at Des Moines, Iowa, December 28, 29, 30, and 31, 1908. Des Moines, Iowa, Emory H. English, state printer, 1909. 247 p. 8°.

Contains: 1. Abbie S. Abbott: The high school and the individual, p. 12-17. 2. Reports of the committee of the educational council: School boards, p. 17-29; Pensions and tenure of office of teachers, p. 30-34. 3. W. H. Norton: The American college and the democratic ideal, p. 46-50. 4. S. L. Chandler: Are college salaries adequate? p. 50-55. 5. G. W. Samson: The trend to one graduate degree, p. 56-60. 6. E. D. Starbuck: How shall we deepen the spiritual life of the college, p. 60-65. 7. F. F. Almy: The way out of the elective class—the group system, p. 65-70. 8. G. C. Fracker: The delinquent college student, p. 70-74. 9. Fannie Duren: Cooperation of teacher and

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librarian in establishing standards for the reading public, p. 74–80. 10. Elizabeth Bills: The teaching of English in the high schools of the West, p. 80–83. 11. R. B. Crone: Medical inspection, p. 97–104. 12. E. F. Schall: School sanitation and hygiene, p. 104–7. 13. F. T. Oldt: School architecture, p. 108–14. 14. Jessie E. Dicks: The relation of the primary to the kindergarten. p. 114–17. 15. W. D. Hanson: How far should the grammar grades prepare for the high school? p. 118–21. 16. O. W. Hunt: The relation of the grade teacher to the principal, p. 121–23. 17. J. R. Hanna: Literature in public school, p. 123–26. 18. J. B. Sullivan. The outsider's view of manual training and its relation to the social and commercial world, p. 126–33. 19. L. C. Bryan: Manual training from the superintendent's viewpoint, p. 140–45. 20. F. T. Tompkins: The future normal institute, p. 146–49. 21. L. C. Brown, F. D. Joseph: The need of more training schools for teachers and how such schools may be provided, p. 19–55, 156–58. 22. F. E. George: Fire protection in public schools, p. 158–62. 23. W. N. Clifford: Forestry and the schools, p. 162–65. 24. A. H. Avery: The superintendent's relation to the high school, p. 165–66. 25. G. E. Weaver: Penmanship in the grades, p. 167–70. 26. J. C. Howell: Penmanship in the high school, p. 170–75. 27. W. S. Hendrixson: The ends to be accomplished through the teaching of science in the secondary schools, p. 180–84. 28. S. L. Thomas: The corrective value of science in the high school, p. 184–86. 29. L. S. Ross: Should there be a place in the high-school course for bacteriology and elementary medicine? p. 186–91. 30. Frank Nagel: The value of music in the public schools, p. 191–95. 31. A. G. Smith: The value of physics as seen from the viewpoint of the college, p. 195–98. 32. J. F. Riggs: The next step in school legislation, p. 199–205.

134. **Iowa state teachers' association.** Proceedings of the fifty-fifth annual session, held at Des Moines, Iowa, November 4, 5, and 6, 1909. Des Moines, Emory H. English, state printer, 1910. 264 p. 8°. (O. E. Smith, secretary, Indianola, Iowa)

Contains: 1. E. J. H. Beard, president: Address, The rural schools, p. 38–45. 2. J. F. Riggs: The state association and school legislation, p. 45–52. 3. Pension and tenure of office of teachers, p. 55–59. 4. Report of the committee on medical inspection in schools, p. 59–76. 5. Report of committee on Master's degree, p. 77–79. 6. F. O. Norton: Are denominational colleges a necessary and permanent part of our educational system? p. 80–88. 7. A. B. Storms: The ethical by-product of higher education, p. 88–95. 8. W. H. Bender: The training of the high school teacher, p. 95–99. 9. C. V. Finlay: The place of the private school in secondary work, p. 99–103. 10. J. C. Nelson: The educational value of the vocational subjects. p. 103–6. 11. J. E. Marshall: School hygiene and sanitation, p. 107–10. 12. F. A. Nims: Ethics, morals, and religious principles in our public schools, p. 110–14. 13. L. G. Focht: The high school course of study, p. 114–16. 14. F. E. King: How to keep the boys in schools, p. 117–19. 15. C. H. Bailey: The educational significance of the arts and crafts movements, p. 120–24. 16. A. C. Newell: Should we aim at the vocational side or the aesthetic in teaching the manual arts? p. 125–27. 17. Fan B. Sanders: The relation of arts to crafts in our public schools, p. 127–30. 18. Dollie D. Burgess: Elementary bookkeeping—object, methods, and results, p. 130–33. 19. Alice M. Hunter: Office practice, p. 133–37. 20. W. R. Baker: Business English and correspondence, p. 137–42. 21. Winifred Cockrell: The application of kindergarten principles, p. 142–45. 22. Celeste Givens: The preservation and culture of the voice, p. 146–50. 23. J. P. Stephenson president college department round table: Address, p. 150–54. 24. H. G. Campbell: Are our colleges meeting their responsibility in respect to moral training? p. 154–61. 25. J. H. T. Main: What is a reasonable requirement for a five year state certificate? p. 161–64. 26. C. M. Miller: Rural school graduation—How successfully accomplished, p. 164–67. 27. W. F. Chevalier: Shall the school year be lengthened to ten months? p. 168–72. 28. J. H. Beveridge: The pensioning of Iowa teachers, p. 172–75. 29. Georgia Alexander: Language and literature in the primary grades, p. 175–84. 30. C. O. Denny: [Latin] Sight reading, p. 185–86. 31. The preparation of high school Latin teachers, p. 187–91. 32. Ellen G. Wing: Manual and domestic arts for girls, p. 191–95. 33. C. H. Brown: Art and manual training, p. 196–98. 34. S. M. Hall: Decoration of school rooms, p. 198–200. 35. The educational value of rhythm, p. 200–3. 36. W. A. Brandenburg: The place of physical education in our public school curriculum, p. 203–6. 37. G. W. Tidd: The advisability of the cultural course in physics, p. 206–7. 38. Etta M. Bardwell: Biology notebooks, p. 208–11. 39. Katherine H. Macy: The cultural value of bird study, p. 211–14. 40. R. B. Wylie: Botany in the Iowa high schools, p. 215–19. 41. E. C. Roberts: The place of geography in the high school, p. 219–21. 42. J. H. Lees: How teachers of physiography can use the Iowa geological survey, p. 221–22. 43. Commercial geography in the high school, p. 222–25. 44. C. P. Colgrove: Training in character building, p. 225–32.

135. **Kentucky educational association.** Proceedings of the thirty-eighth annual session. Estill Springs, Irvine, Ky., June 22–24, 1909. Frankfort, Ky., Frankfort printing co. [1909] 258 p. 8°. (T. W. Vinson, secretary, Frankfort, Ky.)

Contains: 1. Don Carlos Ellis: Forestry and schools, p. 28–36. 2. H. O. Sluss: To what extent shall we yield to the demand for industrial training in our schools? p. 36–42. 3. C. W. Mathews Should we teach agriculture in our elementary schools? p. 49–56. 4. R. H. Crossfield: What are colleges and universities doing for the moral welfare of their students? p. 71–81. 5. Mrs. F. O. Stout:

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Physical education at state university, p. 118-26. 6. J. K. Patterson: The university and its relation to the public high school, p. 131-38. 7. F. F. Thwing: On teaching geometry [high school] p. 167-76. 8. G. M. Money: Enforced attendance for county schools, p. 208-12. 9. N. L. Taylor: The county board of education, p. 220-24.

136. **Louisiana. Conference of high school principals of public education.** Proceedings of the [first] conference, Baton Rouge, La., December 16, 17, and 18, 1908. Baton Rouge, The New advocate official journal, 1909. 142 p. 8°. (Joseph E. Blum, secretary)

137. **Louisiana. Conference of parish superintendents of public education.** Proceedings of the [twenty-first annual] conference, Baton Rouge, Louisiana, December 16, 17, and 18, 1908. Baton Rouge, The New advocate official journal, 1909. 127 p. 8°. (L. J. Alleman, secretary)

138. **Maryland state teachers' association.** [Proceedings of the] forty-second annual meeting, Mountain Lake Park, Md., June 29–July 2, 1909. n. p., 1909. 173 p. 8°. (H. W. Caldwell, secretary, Chesapeake City, Md.)

Contains: 1. Sarah E. Richmond, president: Address, p. 17-22. 2. Aggie J. Davis: Opening exercises, p. 23-25. 3. G. D. Strayer: [Problems of education and possibility of standards of efficiency in teaching] p. 25-32. 4. J. D. Worthington: The country teacher, p. 32-37. 5. Isobel Davidson: English in the primary schools—the teacher's preparation, p. 39-43. 6. Hanna A. Coale: The best ways for expression of ideas, p. 44-48. 7. Nan L. Mildren: Story-telling and the poem in language, p. 48-53. 8. Dandridge Murdaugh: [Reading lessons] p. 53-55. 9. J. M. Gambrill: Education—the old and the new, p. 64-73. 10. G. D. Strayer: [Nature and nurture in determining achievement of individual] p. 74-80. 11. W. H. Wilcox: English in the intermediate grades—the preparation of the teacher, p. 82-87. 12. Anne M. Luman: Composition work and its method, p. 87-90. 13. N. W. Cameron: Cultivation of the imagination, p. 90-95. 14. J. Rosier: Public education and social efficiency, p. 97-103. 15. W. T. Warburton: [Suggestions to teachers] p. 103-109. 16. J. T. White: Opening exercises, p. 110-12. 17. S. S. Handy: Purpose and aim in presentation—aims in literature, p. 112-14. 18. Maude Brown: My method in presenting the English classics, p. 115-19. 19. U. G. Palmer: The use and abuse of English grammar, p. 119-21. 20. Ida P. Stabler: Development of power in the use and appreciation of good English, p. 121-26. 21. Lelia N. McCoy: Use of the school library in teaching English, p. 126-28. 22. G. H. Lamar: Address, p. 131-37. 23. C. T. Wright: Minimum qualifications for first-class teacher's certificate, p. 146-53. 24. J. P. Fockler: The superintendent's visit, p. 155-59. 25. J. W. Thomas, chairman: Report of the committee on "Text books in history," p. 159-60. 26. Report of committee on physical training, p. 160-61.

139. **Massachusetts state teachers' association.** Papers read at sixty-fifth annual meeting, Worcester, November 26, 1909. Journal of education, 70: 568-71, December 2, 1909. (C. M. Grover, secretary, Boston, Mass.)

Contains: 1. A. S. Draper: The necessary groundwork of industrial training, p. 568-69. 2. J. G. Cannon: Commercial education, p. 569-70. 3. Curtis Guild, *jr.*: Materialism and education, p. 570. 4. John Golden: Industrial education from the standpoint of organized labor, p. 570-71. 5. E. G. Cooley: Shall we teach economics in our schools? p. 571.

140. **Michigan schoolmasters' club.** Journal, forty-fourth meeting held in Ann Arbor, March 31, April 1, 2, 3, 1909. Ann Arbor, Michigan, The Club [1909?] vi, 214 p. 4°. (Louis P. Jocelyn, secretary-treasurer, Ann Arbor, Mich.)

Contains: 1. F. A. Manny: The background of the certificate system, p. 3-8. 2. L. J. Wylie: The examining board and its functions. p. 8-19. 3. G. D. Strayer: The meaning of heredity in education, p. 19-29. 4. C. B. Davenport: In how far and in what way is it true that the child is bound by heredity? p. 29-33. 5. R. M. Wenley: What light does heredity throw upon the possible future of education? p. 33-52. 6. E. D. Kelly: Latin in the preparatory schools, p. 64-67. 7. Cecile Gauntlett: The aims and difficulties of beginning Latin. p. 67-69. 8. A. S. Hudson: Problems of the high school Latin course, p. 70-73. 9. C. H. Carrick: Physics, from the viewpoint of the superintendent, p. 74-76. 10. Loa Green: The relation of high school physics to other school studies, p. 76-79. 11. G. A. Miller: The future of mathematics, p. 87-93. 12. J. F. Thomas, Aleida J. Pieters: Some considerations on the report of the Committee of eight on the teaching of history, p. 93-94, 94-95. 13. Lucy Elliott: Applications in historical teaching to modern conditions—ancient history, p. 96-101. 14. Lulu B. Southmayd: Points of contact between English and American history, p. 101-5. 15. L. A. Chase: How far may legal and constitutional problems be emphasized in history teaching? p. 105-6. 16. F. L. Paxson: The legal basis of American history, p. 107-11. 17. Elsie Cooper: Constitutional history in the high school, p. 112-13. 18. N. A. Harvey: The influence of Darwinian doctrines upon the development of psychology, p. 113-18. 19. E. G.

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Lancaster: The effect of the Darwinian doctrines on education, p. 118–23. 20. J. R. Bishop: Some observations upon commercial courses based on a recent visit to English schools, p. 130–38. 21. R. J. Bennett: The study and practice of accountancy, p. 138–46. 22. A. H. Holmes: Cultural value of commercial subjects, p. 146. 23. Gertrude O. Hunnicutt: Entrance requirements for business colleges, p. 147–54. 24. A. H. Holmes: The development of character, p. 155–59. 25. D. H. Springer: Should the university place commercial subjects upon the list of electives from which entrance credits may be chosen? p. 159–66. 26. J. E. Hammond: Business ethics as exemplified by teachers and proprietors, p. 166–72. 27. W. E. Gould: Is the elimination of geology from the high school course of study advisable? p. 178–81. 28. W. H. Hobbs: What should be taught in a year's high school course in physiography? p. 181–83. 29. F. W. Frostic: Some phases of field geography in the high school, p. 184–87. 30. L. D. Scott: The training of the teacher of physical geography, p. 188–89.

141. **Michigan state teachers' association.** Proceedings of the fifty-seventh annual meeting, held at Saginaw, October 28–30, 1909. Moderator-topics, 30: 167–69, 189–92, 211–14, 238–42, 261–66, 325–30, November 4, November 11, November 18, November 25, December 2, December 23, 1909. (John P. Everett, secretary, Ypsilanti, Mich.)

Contains: 1. W. H. French, president: Address, p. 189–91. 2. H. A. Miller: Current criticism of college methods and ideals, p. 212–14. 3. C. G. Wade: Shall the high school be extended downward to include the seventh and eighth grades? p. 238–39. 4. Josephine Goss: Grading and promotion of pupils, p. 240. Discussion, p. 240–41. 5. Edna Lyman: The purpose and results of telling stories to children and the gain to the children from different types of stories, p. 262–64. 6. Florence M. Hopkins: What the library can do for the high-school pupil, p. 264–66. 7. M. S. W. Jefferson: How geography may be made to help the work in history, p. 327–29. 8. Writing in primary grades, p. 329–30.

142. **Minnesota educational association.** Journal of proceedings and addresses of the forty-seventh annual convention, Minneapolis, Minn., October 28–30, 1909. Minneapolis. Minn., 1909. 276 p. 8°. (J. M. Guise, secretary, St. Paul, Minn.)

Contains: 1. W. C. Bagley: Modern education and moral development, p. 54–61. 2. G. A. Franklin: Do industrial courses promise substantial returns in efficiency? p. 63–66. 3. W. S. Jones: Manual training and domestic science; why they should have a place in the school curriculum, and the extent and purposes of the work, p. 140–42. 4. L. E. Covell: Should the free text-book system be adopted? p. 151–55.

143. **Mississippi teachers' association.** Proceedings of the twenty-fifth annual meeting, Meridian, April 28, 29, and 30, 1910. Jackson, Miss., Tucker printing house [1910] 196 p. 8°. (Edward L. Bailey, secretary, Jackson, Miss.)

Contains: 1. J. R. Ellis: President's address, p. 24–31. 2. J. N. Powers: Address, p. 34–39. 3. C. F. Capps: Present educational tendencies, p. 39–46. 4. S. C. Hall: Present educational tendencies, p. 46–48. 5. D. A. Hill: Right views of education, p. 48–51. 6. D. C. Langston: "The place of the manual and industrial arts in education," p. 51–54. 7. J. C. Jones: Physical training in public schools, p. 54–57. 8. J. M. Kennedy: Present day problems in education, p. 57–60. 9. R. H. Hester: A glance at the grammar grades, p. 60–63. 10. T. P. Scott: The two-fold function of the high school—preparation for college and for life, p. 64–70. 11. M. W. Schwartz: [The commercial course] p. 70–75. 12. R. P. Linfield: Should there and can there be a high school course of classical and vocational electives devised to meet present conditions in Mississippi? p. 76–84. 13. J. C. Windham: If such a course is possible, shall the schools or colleges devise it? p. 84–89. 14. G. H. Alford: The work of the National Government in extending agricultural education through the public schools, p. 89–92. 15. W. C. Sweat: The county superintendent in the schoolroom, p. 92–94. 16. G. L. Clothier: Some conservation problems for Mississippi, p. 95–98. 17. Andrew Allison: A laboratory course in physical geography, p. 98–105. 18. Anna L. Fant: The teacher as a nature student, p. 105–9. 19. R. C. Morris: The content of a high school course in botany, p. 109–14. 20. Kate Williams: What a primary teacher should know, p. 120–24. 21. Stella B. Redding: Literature in the primary grades, p. 124–29. 22. Margaret Graham: The problem of the primary teacher in the rural school, p. 130. 23. Winnie Welborne: Nature study: its relation to other subjects and how this relation may be maintained, p. 131–35. 24. Susie V. Powell: Report of Mississippi school improvement association 1909–10, p. 136–39. 25. F. L. Riley: Is state history worth while? p. 140–44. 26. M. W. Schwartz: Mississippi state classical association. The report of the president on the work of the year, p. 144–47. 27. A. L. Bondurant: Present conditions of Latin and Greek study in Mississippi, p. 147–58. 28. M. Latimer: What can be done to stimulate the study of Greek in our high schools? p. 159–61. 29. Margaret J. Warren: The translation: its value in the study of the classics, p. 161–64. 30. Josephine Fitts: Should Latin be taught in the agricultural high schools? p. 164–65.

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144. **Missouri state teachers' association.** Proceedings and addresses, forty-eighth annual meeting, Saint Louis, Missouri, December 28, 29, 30, 1909. Fulton, Mo., The Gazette publishing co., 1910. 344 p. 8°. (E. M. Carter, secretary, Jefferson City, Mo.)

Contains: 1. B. G. Shackleford, president: Address, The faculty of effort as an end in education, p. 27-32. 2. O. Heller: Painful thoughts on painless education, p. 32-35. 3. W. Williams: For the life that now is, p. 36-39. 4. J. M. Greenwood: William Torrey Harris—educator, philosopher, and scholar, p. 39-53. 5. T. M. Johnson: Dr. William T. Harris, p. 53-54. 6. J. D. Elliff: Report on the enforcement of the compulsory attendance law, p. 54-58. 7. H. A. Gass: The country school—a vision of the future, p. 58-63. 8. H. L. Albert: The teacher and the public health, p. 63-71. 9. W. J. Hawkins: Readjustments in our school system, p. 72-79. 10. W. O. Aller.: The function of the college in the training of teachers, p. 80-85. 11. L. B. Sipple: Qualifications of an eighth grade pupil, p. 87-93. 12. M. V. Bashore: The compulsory attendance law, its uses and abuses; what amendments should be made in it, and how to get them, p. 94-95. 13. B. Fox: How may we shorten the course of study for our rural schools? p. 95-98. 14. T. R. Luckett: The age of teachers, p. 98-100. 15. W. Colley: Should certificates be renewed when teachers fail to attend association and other teachers' meetings? p. 100-2. 16. H. E. Braschler: The rural school teacher, preparation and certification. Present conditions, p. 104-5. 17. C. H. McClure: Preparation and certification of teachers, p. 106-15. 18. J. D. Elliff: The rural school problem, p. 115-17. 19. G. H. Capps: Demand for agriculture in the high school, p. 117-19. 20. L. E. Brous: Agriculture in the high school. Demand for such a course, p. 119-21. 21. H. A. Phillips: Contents of a course of study in agriculture for the high school, p. 121-24. 22. L. Ellis: What the elementary school should accomplish in reading and literature, p. 126-29. 23. Elizabeth Bragg: What should we accomplish in language and grammar in the elementary grades? p. 129-31. 24. A. E. Martin: What the elementary schools should accomplish in arithmetic, p. 131-33. 25. J. L. Meriam: Play as a motive for school work, p. 138-42. 26. W. L. Barrett: The summer play school, p. 142-47. 27. M. Burrows: Commercial education in the high school, p. 147-51. 28. Ellen B. Atwater: What topics in ancient and mediæval history need special emphasis to prepare the pupil for the modern period? p. 153-58. 29. Grace Graves: Geographic influence in American history, p. 158-61. 30. S. A. Baker: The future citizen and civics instructions in the high schools, p. 163-65. 31. J. F. Garber: The use of the green house in botany laboratory work, p. 166-69. 32. B. M. Stigall: The status of nature study in our system of education, p. 169-73. 33. A. S. Langsdorf: Some tendencies in engineering education, p. 173-77. 34. O. E. Winebrenner: Chemistry, of what use is it? p. 187-89. 35. Lindley Pyle: The use of the graph and graphical methods in the teaching of physics, p. 190-91. 36. M. J. Patterson: Arithmetic in the grades, p. 192-98. 37. W. A. Luby: Comparison of arithmetic with algebra and geometry, p. 198-204. 38. B. Cosby: Some real problems in arithmetic, p. 204-9. 39. R. A. Wells: The use of equation in elementary arithmetic, p. 209-13. 40. H. F. Pratt: The teaching of commercial arithmetic in the high school, p. 213-19. 41. G. Melcher: The value of the history of arithmetic, p. 219-27. 42. D. E. Riggs: Psychology of music, p. 228-33. 43. Lena M. Spoor: The true mission of public school music, p. 233-35. 44. Teresa Finn: The correlation of public school music with the after study of music, p. 236-37. 45. W. L. Eastwood: The place of the vocational school in a rational scheme of education, p. 238-40. 46. Alberta G. Murphy: School room decoration, p. 240-44. 47. Stella C. Harris: Some problems of the present in industrial work, p. 244-47. 48. W. H. Funk: Manual training in the grades, p. 247-49. 49. J. B. Game: Training and equipment of the high school teacher of Latin, p. 250-54. 50. Laura Yeater: The race problem in Cæsar, p. 254-59. 51. M. M. Hart: The acquisition of power in classics, p. 259-65. 52. Eva Johnston: Introduction of the Menæchmi of Plautus, p. 265-67. 53. F. H. Barbee: Direction of outside reading in English, p. 274-79. 54. L. W. Rader: The elementary school course in English, p. 280-88. 55. W. Hanssler: What modern German literature is adapted for secondary schools? 1. For thorough classroom reading. 2. For collateral and rapid reading courses, p. 288-93. 56. J. H. Beckman: How can this society best perform its mission toward improving the instruction in German in Missouri? p. 293-97. 57. G. Douay: The preparation of students in French for entrance to college, p. 297-302. 58. J. A. Vaeth: The teaching of French, p. 302-7. 59. Julia Krug: Short cuts to a knowledge of the best books for children, p. 309-13. 60. Laura Doolittle: The use of the library in teaching history in the elementary school, p. 313-15

145. **New Jersey state teachers' association.** Annual report and proceedings of the 55th annual meeting, held in the public high school, Atlantic City, N. J., December 28, 29, and 30, 1909. [Trenton, N. J., Beers & Frey, 1910] 246 p. 8°. (Charles B. Boyer, secretary, Atlantic City, N. J.)

Contains: 1. C. J. Baxter: Industrial education, p. 18-20. 2. E. R. Johnstone: "What shall we do with the backward child?" p. 21-24. 3. J. M. Green: Our educational system, its cost and its return, p. 25-31. 4. Woodrow Wilson: "The state and the citizen's relation to it," p. 32-42. 5. Mrs. W. I. Thomas: The juvenile delinquent and the schools, p. 43-51. 6. L. S. Davis: The trend of the teens, p. 52-59. 7. J. F. Fort: New Jersey and its schools, p. 60-68. 8. E. A. Alder-

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man: The educational achievement of a generation, p. 69–80. 9. J. W. Carr: Character development through the agency of the public schools, p. 81–89. 10. Naomi Norsworthy: Teaching children to study (an abstract), p. 98–101. 11. F. A. Parsons: The call of the arts and crafts and our response (an abstract), p. 102–4. 12. President's address, p. 217–41.

146. **New York (State) Associated academic principals.** Proceedings of the twenty-fourth annual meeting, at Syracuse, N. Y., December 28–30, 1908. Albany, University of the State of New York, 1909. 114 p. 8°. (Education department bulletin, no. 458) (E. P. Smith, secretary, 1911, North Tonawanda, N. Y.)

Contains: 1. F. E. Wade: Probation as a means of overcoming truancy, p. 7–17. 2. E. L. Stevens: How shall local industries be recruited? p. 19–32. Discussion, p. 32–38. 3. G. P. Bristol: Foreign languages in the high school, p. 39–46. Discussion, p. 46–52. 4. A. R. Brubacher: The high school principal, p. 52–59. 5. C. F. Wheelock: Educational developments under the syllabus of 1905, p. 60–68. 6. W. H. Crawshaw: Poetry and social progress, p. 69–82. 7. S. S. Travis: High school fraternities, p. 83–91. Discussion, p. 91–95. 8. E. L. Mead, chairman: Report of committee on athletics, p. 96–98. 9. C. L. Mosher, chairman: Report of committee on present courses of study, p. 98–100.

147. **New York state association of school commissioners and superintendents.** Proceedings of the fifth-fourth annual meeting, at Rochester, N. Y., November 22–24, 1909. Albany, University of the state of New York, 1910. 72 p. 8°. (Education department bulletin, no. 472) (Jane Haring, secretary, 1910–11)

Contains: 1. T. D. Wood: Rural school sanitation, p. 6–13. 2. D. D. T. Marshall: What constitutes efficient supervision? p. 14–17. 3. W. T. Clark: Report of committee on rural school problems, p. 19–20. Discussion, p. 20–29. 4. F. M. Godfrey: Agriculture and nature study, p. 32–35, 36. 5. J. V. Sturges: The library, p. 37–47. 6. J. S. Cooley, M. B. Mann: Some phases of school sanitation, p. 56–60, 60–65.

148. **New York state science teachers' association.** Proceedings of the thirteenth annual meeting, held at Syracuse university, Syracuse, N. Y., December 29–30, 1908. Albany, University of the State of New York, 1909. 138 p. 8° (Education department bulletin, no. 459) (L. I. Hawkins, president, 1911, Cortland, N. Y.)

Contains: 1. G. F. Warren: High school agriculture, p. 21–28. 2. L. S. Hawkins, Augustus Klock: Science for elementary schools, p. 30–34, 34–38. 3. H. A. Carpenter: Ionization theory, p. 42–51. 4. W. G. Levison: A method and apparatus for detecting and exhibiting the fluorescence of fluorescent substances, p. 52–54. 5. I. D. Scott: A demonstration of a map and modeling apparatus, p. 59–61. 6. R. L. Fernbach: The chemist versus the trained workman, p. 65–70. 7. Charles Forbes: Demonstration of physical apparatus, p. 71–76. 8. William Timbre: Some practical physics apparatus, p. 77–88. 9. B. O. Burgin: Demonstration of dynamo and motor, p. 90–92. 10. S. B. Everts: Plain cross section drawings on cardboard for school use, p. 95–99. 11. A. G. Clements: Why are the ideals of biology teaching not realized? p. 100–3. 12. C. G. Rogers: The present and future of physiology in the high school, p. 104–14. 13. H. M. Smith: Recent progress in artificial illumination, p. 115–30.

149. **New York state teachers' association.** Proceedings of the sixty-third annual meeting, held at Syracuse, N. Y., December 28–30, 1908. Albany, University of the State of New York, 1909. 414 p. 8°. (Education department bulletin, no. 457) (Richard A. Searing, secretary, North Tonawanda, N. Y.)

Contains: 1. S. S. Wise: Teacher and child, p. 7–19. 2. J. P. O'Hern, president: The teacher of English, p. 38–52. 3. Matilda T. Karnes: The dramatic instinct an aid in composition writing, p. 53–64. 4. F. T. Scott: The preparatory fallacy, p. 65–74. 5. C. E. Jones: Proposed changes in the syllabus, p. 75–79. 6. E. D. Holmes, chairman: Report of the committee on the work of teachers of English in high schools, p. 80–82. 7. Margaret K. Smith: The psychological aspect of training backward children, p. 85–94. 8. E. R. Johnstone: The social side of the question of special class children, p. 95–98. 9. Sophie C. Becker: The training of defective children from a principal's standpoint, p. 99–114. 10. A. W. Edson: Training of backward children, p. 114–15. 11. Grace L. Cook: The training of teachers in Great Britain, p. 117–23. 12. F. J. Cheney: Our normal schools, p. 124–35. 13. David Gibbs: The normal training school, p. 136–46. 14. Harriet E. Stevens: Primary reading, p. 147–53. 15. Edith M. Tufts: The place and value of the rhyme in beginning

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reading: how should the various methods be coordinated? p. 154–56. 16. F. H. Collins: Essentials of instruction in drawing for elementary schools, p. 168–74. 17. R. K. Piez: Perspective: the grammar of pictorial drawing, p. 175–77. 18. A. D. Dean: The relation of the manual arts in elementary and secondary schools to the movement for industrial education. p. 178–82. 19. Schuyler Bull: Lettering, p. 183–84. 20. Bonnie E. Snow: Round table discussion on art and drawing instruction in the primary grades, p. 185–87. 21. F. E. Welles: An inductive method of teaching Cæsar, p. 191–95. 22. J. P. Behm: Cæsar through the eyes of Cicero, p. 197–205. 23. J. R. Fairgrieve: Greek in the high school, p. 207–11. Discussion, p. 211–12. 24. J. I. Bennett: Greek in the colleges, p. 213–15. Discussion, p. 215–17. 25. C. C. Macgregory: The place of drawing and the mechanic arts in a commercial course, p. 219–27. 26. A. J. Scarborough: Business correspondence—getting results, p. 229–33. 27. G. M. Forbes: The general problem of extending the educational system to prepare for industrial pursuits, p. 240–41. Discussion, p. 241–43. 28. W. Noyes: The definite contribution which manual arts and drawing may make toward industrial efficiency, p. 244–46. Discussion, p. 247–51. 29. J. E. Sweet: Trade schools: their place in the public school system, p. 252–54. Discussion, p. 254–56. 30. Sherman Williams: With what purpose in view should history be taught? p. 257–62. 31. S. D. Arms: In the teaching of civics, on what phase or phases of it should the chief emphasis be laid? p. 263–66. 32. P. S. Maguire: What should be the course in history for graduation from high schools? What history ought to be demanded by colleges in their requirements for admission? p. 267–73. 33. E. W. Ames: Purpose of an examination in history, p. 274–77. 34. Nature study discussion, p. 278–79. 35. H. N. Parsons: Library books best adapted for pupils of the various grades, p. 284–91. 36. J. E. Banta: Use of the dictionary in the grades, p. 292–93. 37. W. C. Kruse: The reading of library books, p. 294–95. 38. C. W. Blessing: What changes or omissions should be made in the library books or in the selections for memorizing given for the various grades in the New York State syllabus? p. 296–303. Discussion, p. 303–6. 39. A. W. Edson: Group teaching in elementary grades, p. 307–11. 40. A. C. Thompson: Ways and means of emphasizing vital points in the essential subjects in elementary schools, p. 312–16. Discussion, p. 316–18. 41. Georgia Alexander: How may instruction in spelling be made more effective? p. 319–28. 42. H. P. Emerson: English schools, p. 329–35. 43. C. E. White: My visit to English schools, p. 336–43. 44. L. F. Hanmer: The relation of athletics to the school, p. 344–51. 45. F. H. Dimick: Elementary schools athletic league, p. 352–56. 46. E. J. Ward: The conduct and benefits of playgrounds, p. 357–62. 47. Jessie H. Bancroft: The place of games and folk dances in the school curriculum, p. 363–68. 48. What changes are desirable in the New York State elementary syllabus? Discussion, p. 368–69.

150. **New York (State) University. University convocation.** Proceedings of the forty-seventh annual convocation, October 28–30, 1909. Albany, University of the state of New York, 1909. 126 p. 8°. (Education department. Bulletin no. 460)

Contains: 1. LeB. R. Briggs: The American college and the American university, p. 10–26. 2. W. D. Johnston: The library as a reinforcement of the school, p. 27–32. Discussion by Ida M. Mendenhall and Mary E. Hall, p. 33–42. 3. J. M. Green: Teaching as an occupation for men, influences adverse and favorable, p. 43–51. 4. A. S. Draper: The relative educational standing of New York state, p. 59–74. 5. J. M. Thomas: Moral instruction in high schools and colleges, p. 75–85. 6. Rush Rhees: Applied science and liberal culture, p. 86–94. 7. Julius Sachs: Improved standards in teaching Latin, p. 95–106. 8. R. C. S. Drummond: The organization and direction of athletic sports in secondary schools, p. 114–23.

151. **North Carolina association of city public school superintendents and principals.** Proceedings and addresses of the twenty-fifth annual session, Durham, N. C., January 27–29, 1910. Raleigh, N. C., Edwards & Broughton printing company, 1910. 95 p. 8°. (A. T. Allen, secretary, 1911, Salisbury, N.C.)

Contains: 1. W. R. Mills: School reports and school efficiency, p. 8–13. 2. W. D. Carmichael: Report of the Committee on economy in the course of study, p. 18–48. 3. J. A. Bivins: How to make the teachers' meeting more effective, p. 52–61. 4. R. J. Tighe: Teaching children how to study, p. 62–73. 5. E. C. Brooks: A comparison of school systems, p. 74–94.

152. **North Carolina teachers' assembly.** Proceedings and addresses of the twenty-fifth annual session, held at Charlotte, N. C., June 16–19, 1908. Raleigh, N. C., Presses of Edwards & Broughton printing co., 1909. 343 p. 8°.

Contains: 1. P. P. Claxton: The school and the state, p. 58–85. 2. S. A. Knapp: What can the teacher do for the improvement of rural conditions? p. 116–30. 3. O. T. Corson: The superintendent and the board of education, p. 229–35. 4. C. L. Coon: Science in the schools, p. 249–54. 5. Mrs. C. D. McIver: History of the woman's association for the betterment of public schoolhouses and grounds in North Carolina, p. 318–26.

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153. **North Carolina teachers' assembly.** Proceedings and addresses of the twenty-sixth annual session, Morehead City, N. C., June 15–18, 1909. Raleigh, Presses of Edwards & Broughton printing company, 1909. 233 p. 8°. (R. D. W. Connor, secretary-treasurer)

Contains: 1. D. H. Hill: Opening address, p. 14–21. 2. T. R. Foust: President's annual address, p. 21–30. 3. E. K. Graham: The teacher and modern democracy, p. 30–43. 4. Mrs. C. D. McIver: The woman's association for the betterment of public schoolhouses and grounds, p. 43–48. 5. W. P. Few: Constructive educational leadership, p. 49–59. 6. C. L. Coon: Report of assembly committee on the history of education for 1908–1909, p. 69–75. 7. F. P. Hobgood: Report of committee on professional ethics, p. 76–83. 8. R. J. Tighe: Report of committee on teachers' salaries, p. 84–102. 9. J. Y. Joyner: Report of committee on course of study, p. 102–3. 10. Ellen H. Richards: How may the school influence the home? p. 103–11. 11. J. H. Highsmith: Directions and suggestions for child study, p. 112–19. 12. Anne Wetmore: Directions and suggestions for child study, p. 119–32. 13. Mary O. Graham: Child study as an aid in discipline, p. 132–42. 14. Mrs. I. T. Turlington: Child study as an aid in discipline, p. 142–54. 15. Mary K. Applewhite: Child study as an aid in instruction, p. 154–58. 16. Mrs. A. C. Gareissen: Child study as an aid to instruction, p. 158–71. 17. W. A. Graham: Science in the grammar school, p. 172–78. 18. Z. V. Judd: Science in the rural elementary school, p. 178–89. 19. H. L. Smith: Science in the high schools, p. 189–95. 20. A. C. Reynolds: The teachers' meeting, p. 196–202. 21. J. A. Bivins: The teachers' institute, p. 202–14. 22. M. C. S. Noble: The teachers' institute, p. 214–17. 23. E. C. Brooks: Home study for teachers, p. 217–24.

154. **North Dakota educational association.** Proceedings of the twenty-second annual session, held at Valley City, December 30 and 31, 1908, and January 1, 1909. Bismarck, N. D., Tribune, state printers and binders, 1909. 367 p. 8°.

Contains: 1. J. M. Gillette: Education for social efficiency, p. 57–63. 2. F. M. Sherarts: High school constants and college entrance requirements, p. 81–88. 3. H. S. Buffum: Concept of vocational education and methods of realization, p. 105–10. 4. C. C. Gray: Our attitude toward vocational training in the high school, p. 169–78. 5. E. M. Sherry: The desirability of instruction in the elements of agriculture in schools for rural communities, p. 228–39. 6. C. M. Beitler: How can high school algebra be made attractive to pupils, p. 261–62.

155. ——— Proceedings of the twenty-third annual session, held at Minot, December 28 to 31, 1909. Bismarck, N. D., Tribune, state printers and binders, 1910. 375 p. 8°. (C. R. Travis, secretary, Mayville, N. D.)

Contains: 1. A. P. Hollis, president: Address, p. 33–37. 2. W. L. Stockwell: The educational outlook in North Dakota, p. 38–42. 3. F. L. McVey: Recent educational tendencies, p. 43–47. 4. Report of committee of seven on adjustment of educational work in North Dakota with reference to the needs of the times, p. 48–105; L. G. Watson, G. F. Forster: Discussion of report of committee of seven, p. 105–7, 108–11. 5. Charlton Andrews: The influence of a higher institution of learning on the town in which it is located, p. 111–14. 6. M. A. Brannon: The influence of higher institutions of learning on a group of towns, p. 115–19. 7. A. D. Weeks: Ways in which the higher institutions may serve rural communities, p. 120–23. 8. W. M. Kern: How the school may influence industrial life, p. 123–28. 9. E. M. Sherry: Extension of school into life; the teacher's special preparation for this, p. 128–30. 10. Minnie J. Nielson: Extending "life" into the rural schools, p. 131–34. 11. G. A. McFarland: Means of extending the influence of higher educational instruction into life, p. 138–42. 12. Wallace Stearns: The lecture as a means of extending the influence of the higher educational institutions into life, p. 143–44. 13. J. H. Shepperd: Farmers' and teachers' institutes, p. 145–47. 14. G. F. Ruediger: Bulletins and school publications, p. 148–50. 15. J. M. Gillette: Extension of the influence of the higher institutions of learning by correspondence, p. 151–55. 16. C. C. Creegan: Means of extending the influence of the higher educational institutions into life for the improvement of citizenship, p. 156–61. 17. Joseph Kennedy: The means of extending the influence of the higher educational institutions for the improvement of the rural school, p. 162–67. 18. E. R. Edwards: Some current problems of secondary education, p. 173–77. 19. Nelson Sauvain: Value of elementary and secondary education compared with present cost, p. 177–81. 20. P. T. McNally: The Mandan plan of classification, p. 182–84. 21. L. P. Linn: The province of the high school in the preparation for life, p. 185–89. 22. P. A. McMillan: Are our schools meeting the real needs of the young people of North Dakota, p. 190–96. 23. F. Thordardson: The tobacco habit among pupils: is there a remedy? p. 197–201. 24. P. S. Berg: The relative value of high school studies—how shall they be determined? p. 202–11. 25. Dorothy M. Poppy: Proper relation of high school teachers toward high school social functions, p. 212–15. 26. H. L. Rockwood: The high school and physical education, p. 216–19. 27. B. A. Dunbar: Our athletic league—can it be made more practicable? p. 220–24. 28. H. A. Curran: How to judge text books in history and English, p. 225–28. 29. B. A. Wallace: Five problems of the teacher in teaching, p. 229–35. 30. Eula F. Miller: Construction and seat work, p. 238–40. 31. C. C. Gray: The teaching of geography

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not all textbook work, p. 241–53. 32. F. R. Barnes: How to correct the present defects in the rural school, p. 259–66. 33. Dalton McDonald: How to create the proper school spirit among the patrons of rural schools, p. 267–70. 34. B. O. Skrivseth: The need of special training for rural school teachers, p. 271–74. 35. B. A. Wallace: The course of study for rural schools, p. 275–81. 36. F. M. Wanner: Better supervision of the rural schools—in what does proper supervision consist, p. 282–83. 37. E. C. Hilborn: Improvement of school grounds, p. 286–91. 38. H. L. Bolley: Observation and teaching, p. 299–303. 39. M. N. Pope: The correlation of the physical geography with the political and commercial phases of the subject, p. 304–7. 40. G. F. Forster: The teaching of agriculture, p. 308–11. 41. G. R. Davies: School mathematics applied to the environment of the pupil, p. 312–19. 42. J. S. French: How may we give sciences their true cultural value in the class room, p. 320–22. 43. M. A. Brannon: What botany should be taught in the first year of plant study, p. 323–26. 44. H. L. Rockwood: Our prospects, p. 330–32. 45. H. C. Fish: High school museums and what can be done with them, p. 333–36. 46. Miss L. H. Bruhn: History—how to make it interesting to those who do not like it, p. 337–40. 47. Lillian G. Hall: How the teaching of history, civics, and social science may be made more efficient in the rural schools, p. 341–42. 48. Phoebe L. Minsart: How the teaching of history, civics, and social science can be made more efficient in the grades, p. 343–46. 49. W. A. Godward: History and civics in the high school, p. 347–49. 50. R. M. Black: How can we make the teaching of history, civics, and the social sciences more efficient in the teachers' training school, p. 350–53. 51. W. N. Stearns: On the teaching of history in the university, p. 354–56. 52. W. B. Thomas: Summary and plans for cooperation in history, p. 357–63. 53. Fanny C. Amidon: How to teach music in the high school, p. 368–70. 54. Clara B. Aldahl: How to interest boys in music throughout the eighth grade and high school, p. 371–73.

156. **Ohio college association.** *See* 800.

157. **Ohio state teachers' association.** [Proceedings of the] sixtieth annual session, June 29–July 1, 1909. Ohio educational monthly, 58: 331–403, July 1909.

Contains: 1. J. A. Shawan, president: The educational outlook, p. 331–36. 2. J. M. H. Fredrich: Appropriate education with reference to sex during the adolescent period, p. 336–37. Discussion, p. 337–42. 3. C. B. Galbreath: The library movement in Ohio, p. 343–48. 4. W. H. Elson: The measurement of efficiency and progress in school work, p. 348–52. 5. Dan Milliken: The gifted simpleton, p. 352–61. 6. F. B. Dyer: Intelligent cooperation between home and school, p. 361–68. 7. H. V. Hotchkiss: The ethics of the teacher, p. 376–83. 8. Josiah Strong: The times in which we live, p. 383–87. 9. E. A. Jones: Remarks as retiring commissioner, p. 387–89. 10. J. W. Zeller: The needs of our public schools, p. 389–93. 11. Herbert Welch: The socialization of the school, p. 393–97.

158. ——— [Proceedings of the] sixty-first annual session, June 28–30, 1910. Ohio educational monthly, 59 : [309]–398, July 1910.

Contains: 1. F. B. Dyer, president: Address, Teaching as a profession, p. 309–17. 2. E. A. Jones: A state-wide pension system, p. 317–24. 3. E. F. Moulton: Report of the legislative committee, p. 324–27. 4. H. C. Muckley: The physical care of school children, p. 327–33. 5. N. D. O. Wilson: Discussion, p. 333–35. 6. J. D. Simkins: Compulsory school laws, p. 335–41. 7. W. T. Magruder: The possibilities of industrial education, p. 341–48. 8. E. A. Hotchkiss: The problem of industrial education in small cities, p. 348–53. 9. J. W. Zeller: The problem of industrial education in the rural schools, p. 353–57. 10. G. C. Dietrich: Discussion, p. 357–60. 11. W. O. Thompson: Memorial address, p. 371–76. 12. J. V. McMillen: Confessions of a superintendent, p. 376–81. 13. F. B. Pearson: Confessions of a secondary teacher, p. 381–83. 14. Lillie A. Faris: Confessions of an elementary teacher, p. 383–86. Discussion, p. 386–93.

159. **Pennsylvania state educational association.** Proceedings of the fifty-third annual convention, held in Bethlehem, June 29 and 30 and July 1, 1909. Reprinted from the Pennsylvania school journal. 58 p. 8°. (J. P. McCaskey, secretary, Lancaster, Pa.)

Contains: 1. C. S. Foos: Pressing problems of state organization, p. 5–13. 2. W. H. P. Faunce: Pressing problems in education, p. 14–17. 3. J. C. Wagner, T. S. March, A. L. Jones, Joseph Howerth: Pressing problems in the borough schools, p. 18–20, 20–21, 21–23, 23–24. 4. J. P. McCaskey: The ever-pressing problem is the building of character, p. 24–25. 5. J. G. Becht, E. L. Kemp, A. T. Smith, A. C. Rothermel: Pressing problems in the normal schools, p. 26–28, 28, 28–30, 30–31. 6. E. D. Warfield, J. A. W. Haas, G. L. Omwake: Pressing problems in the colleges, p. 32, 32–33, 33. 7. S. S. Wise: Teacher and child, p. 33–39. 8. H. S. Putnam, T. S. Davis, W. W. Evans, and others: Pressing problems in rural schools, p. 39–42. 9. H. C. Missimer, J. J. Palmer, G. E. Reed: Pressing problems in the city schools, p. 42–46, 46–47, 47.

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159*a*. **Pennsylvania state educational association.** Department conferences at Bethlehem . . . June 29 and 30 and July 1, 1909. Reprinted from the Pennsylvania school journal. 53 p. 8°.

Contains: 1. W. C. McClellan, F. L. Homer, G. W. Gerwig: High school course in English in relation to entrance requirements and best interests of student, p. 1–6, 6–8, 8–9. 2. W. B. Owen, I. C. M. Ellenberger, T. L. Brooks: High school training and its bearing upon civic integrity, p. 9–11, 11–12, 12–13. 3. W. S. Franklin: Work and play in education, p. 13–23. 4. G. M. Jones: Eyes that see not, p. 23–26. 5. Alice N. Parker: Pressing problems in the kindergarten, p. 27–30. 6. Henry Pease: The needs of the kindergarten, p. 30–31. 7. O. H. Bakeless: Economic worth of child study, p. 31–37. 8. J. L. Eisenberg, Percy Hughes: Pedagogical significance of instincts of the child, p. 37–39, 39–40. 9. Zetian Gordon: The special school for defective children, p. 40–43. 10. C. E. Karlson, B. M. Le Suer: Pressing problems in manual training, p. 44–45, 45–46. 11. C. A. Herrick, R. L. Johnson: Present condition of manual training and trade education, p. 46, 47–49. 12. F. E. Pray: Present status of industrial education, p. 49–51. 13. Iris Prouty: The present status of manual training and industrial education, p. 51–52. 14. W. L. Sayre: Manual training means mental training, p. 52–53.

159*b*. ——— **City and borough superintendents' department.** Proceedings of nineteenth annual session, Harrisburg, February 6, 7, and 8, 1909. Reprinted from the Pennsylvania school journal. 42 p. 8°.

Contains: 1. F. W. Robins, president: Address—Revision of elementary course of study, p. 1–4. 2. T. S. March: Revision of course of study, p. 4–6. 3. A. D. Vocum: State uniformity with elasticity in courses of study, p. 7–12. 4. Alvin Davison: Medical inspection of schools, p. 13–17. 5. H. J. Wightman: Improvement of the teaching force by salary schedules, p. 19–21. 6. W. A. Wilson: The improvement of the teacher by other means, p. 26–28. 7. R. L. Burns: Schools as community centers, p. 32–34. 8. J. L. Stewart: Development of the social conscience, p. 37–38. Discussions follow each topic.

159*c*. ——— ——— Proceedings of twentieth annual session, Harrisburg, February 8 and 9, 1910. Pennsylvania school journal, 58 : 471–524, May 1910.

Contains: 1. Grant Norris, president, and C. J. Scott: Educational trends, p. 471–75, 475–78. 2. L. P. Ayres: Relation of physical defects to school progress, p. 478–80. 3. J. W. Anthony, C. F. Hoban: Compulsory education in Pennsylvania, p. 481–88, 489. 4. M. E. Bennett: How to create writing ability, p. 490–91. 5. L. P. Ayres: Retardation: its significance and cure, p. 492–94. 6. L. H. Gulick: How to apply what we know about health, p. 495–500. 7. Samuel Hamilton: A plea for industrial education, p. 500–10. 8. H. C. Missimer, J. M. Coughlin: Industrial education, p. 510, 510–11. 9. L. H. Gulick: How the backward child is putting education among the sciences, p. 512–17. 10. O. P. Cornman: Backward children investigation in Philadelphia public schools, p. 518–21.

159*d*. ——— **County superintendents' department.** Proceedings of sixth annual session, Harrisburg, February 3 and 4, 1909. Reprinted from the Pennsylvania school journal. 40 p. 8°.

Contains: 1. G. A. Grim: The school board—five or more members—when take office—how selected? p. 1–2. 2. J. H. Hoffman: A revision of the school curriculum. What eliminate for thoroughness?—What add to make more practical? p. 2–4. 3. G. M. Philips: The new school code (questions and answers), p. 5–6. 4. J. H. Landis: How the school can best aid the home in its functions, p. 6–9. 5. E. M. Rapp: Vocational possibilities in country schools, p. 10–15. 6. Earl Barnes: Character building, p. 15–20. 7. G. B. Milnor: More effective school supervision, p. 20–23. 8. B. S. Boyle: How to make superintendents' visits most helpful? p. 23–26. 9. H. M. Roth: What a superintendent may do with added power and time, p. 26–27. Discussion, p. 27–30. 10. W. W. Evans: An elastic uniform course of study, p. 30–32. 11. N. C. Schaeffer: The new school code, p. 34–37. 12. Samuel Hamilton: Undue haste in education, p. 37–40.

159*e*. ——— ——— Proceedings of seventh annual session, Harrisburg, February 8 and 9, 1910. Pennsylvania school journal, 58 : 425–52, April 1910.

Contains: 1. I. H. Russell: How to improve certification of teachers, p. 425–28. 2. L. E. Smith: What change or improvement can be made in salary, p. 428–29. Discussion, p. 429–34. 3. J. W. Sweeney: Preparation for supervision, p. 434–37. 4. R. C. Shaw: Closer supervision, p. 437–40. 5. D. A. Kline: Medical inspection, p. 441–43. 6. J. K. Green: Waste in our schools, p. 443–47. 7. N. C. Schaeffer: Our problems, p. 449–50. 8. M. G. Brumbaugh: Philanthropy and public education, p. 450–52.

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159*f*. **Pennsylvania state educational association. Directors' department.** Proceedings of fourteenth annual session, Harrisburg, February 4 and 5, 1909. Reprinted from the Pennsylvania school journal. 30 p. 8°.

Contains: 1. E. T. Furguson: Closer supervision of rural schools, p. 3-5. 2. H. B. Eastburn: The school code on closer supervision, p. 5-7. 3. H. W. Schick, president: Address, p. 7-9. 4. M. P. Wilson: Commercial museum collections, p. 9-10. 5. N. C. Schaeffer: Retardation in the grades and the new code, p. 10-13. 6. J. L. King: How a director may make the schools more efficient, p. 13-15. 7. H. M. Lessig, chairman: Report of the legislative committee, p. 17-18. Discussion, p. 18-21. 8. Samuel Hamilton: Individual efficiency, p. 21-24. 9. W. L. Phillips: A modern school, p. 24-28. 10. J. B. Small: Grounding in the fundamentals, p. 28.

159*g*. ——— ——— Proceedings of fifteenth annual session, Harrisburg, February 10 and 11, 1910. Pennsylvania school journal, 58 : 379–415, March 1910.

Contains: 1. A. J. Simons: Condition of our rural schools, p. 380-83. 2. H. T. Hauer: Building the school house, p. 383-88. 3. J. A. Steese, R. S. Murphy: What the director may try to do for the schools, p. 388-89, 389-93. 4. N. C. Schaeffer: Failure of directors to maintain proper schools, p. 393-94. 5. W. F. Eberle: Manual training, p. 394-98. 6. J. D. Walker: A few changes in city schools, p. 398-99. 7. M. G. Brumbaugh: Problems of origin, destiny and duty, p. 402-3. 8. Samuel Hamilton: Hills, p. 404-9. 9. R. B. Tietrick: The conservation of real wealth, p. 410-13.

159*h*. ——— **High school department.** Proceedings of fourth annual session, Harrisburg, Pa., December 28, 29 and 30, 1908. Reprinted from the Pennsylvania school journal. 40 p. 8°.

Contains: 1. W. S. Steele: Secret fraternities in high schools, p. 1-3. 2. G. D. Robb: Special classes for backward pupils, p. 3. 3. P. M. Bullard: Preventing loss of first-year pupils, p. 3-4. 4. J. W. Moyer: How we manage our athletics, p. 4-5. 5. J. W. Moyer: The northeast forestry club, p. 5. 6. A. E. Kraybill: Home study of high school pupils, p. 5-6. 7. J. E. Wagner: Special work in agriculture in the high school, p. 6-10. 8. Irene E. McDermott: Household economy in the high school, p. 10-12. 9. W. S. Hertzog, C. D. Koch: Special work in the general high school, p. 12-13, 13. 10. A. D. Yocum: Training of high school teachers: a plea for colleges of education, p. 13-17. 11. O. H. Bakeless: The preparation and improvement of the high school teacher, p. 18-21. 12. L. E. McGinnes: Competent high school teachers, p. 21-23. 13. C. F. Hodge: Civic biology: a high school science devoted to community welfare and the national life, p. 24-30. 14. T. J. George: What are the reasonable requirements for admission to the high school? How shall these be enforced? p. 30-32. 15. F. E. Downes: What are the reasonable requirements? p. 32-34. 16. E. W. Little: The constants that all the colleges may reasonably exact for admission: how to be agreed upon and how enforced, p. 34-36. Discussion, p. 36-37. 17. E. W. Little, chairman: Report of the special committee of the National education association on the six year course of study, p. 38-39.

159*i*. ——— ——— Proceedings of fifth annual session, Harrisburg, Pa., December 28, 29 and 30, 1909. Pennsylvania school journal, 58 : 333–73, February 1910.

Contains: 1. J. L. Eisenberg, R. P. Gleason: How can the high school serve and reach the entire public? p. 333-35, 335-36. 2. Sarah M. Gallaher, S. E. Downs: Proper adjustment of history courses in high schools so as to articulate closely with the elementary school and meet college requirements, p. 336-38, 338-39. 3. H. B. Davis, F. W. Wright: Legitimate scope of the small high school in relation to the normal school, p. 339-40, 340-42. 4. J. T. Morris, D. H. Robbins: Needed changes in the teaching of mathematics in the high school, to meet the demands of the industrial school, p. 342-43, 343-45. 5. Jane Mathews: Work on high school mathematics to be done by the International commission on the teaching of mathematics, p. 345-47. Discussion, p. 347-49. 6. Edwin Lee, J. B. Geissinger: Legitimate scope of the small high school in relation to preparation for college, p. 349-53, 354-56. 7. E. E. Sparks: Shifting ideals and how to meet them, p. 358-64. 8. E. M. Phillips: What state inspection has done and is doing for the schools of Minnesota, p. 364-70. 9. David Snedden: Practical results of the professional training of secondary school teachers in certain American states, p. 370-72.

160. **Public education association of Worcester, Massachusetts.** Fourth annual report, May 1909. 51 p. 8°. (Mrs. Joseph H. Robinson, secretary, 106 Pleasant street, Worcester, Mass.)

Contains: 1. W. H. Burnham: A modern system of school administration, p. 13-21. 2. Mary E. Barrell: Physical education, p. 32-34. 3. L. C. Miller: Medical inspection, p. 34-39.

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161. **Schoolmasters' association of New York and vicinity.** Sixteenth annual report, 1908–1909. [New York, Vanden Houten company, 1909] 76 p. 8°.

Contains: 1. J. H. Denbigh: Some problems of the secondary school, p. 7–17 (Discussion, p. 17–20). 2. J. G. Croswell: Studying for the market, p. 21–27. 3. Julius Sachs: Recent impressions of modern language teaching in Germany, p. 28–39 (Discussion, p. 39–42). 4. C. D. Larkins: Some impressions of English schools, p. 43–47. 5. W. E. Chancellor: Some neglected factors in the social situation, p. 48–62. 6. N. M. Butler: General problem of college entrance or admission to college, p. 64–75.

—— Seventeenth annual report, 1909–1910. [Cumberland, Md., The Eddy press corporation, 1910] 68 p. 8°. (Arthur M. Wolfson, secretary, New York city)

Contains: 1. Wilson Farrand: Report of committee on conference with colleges, p. 6–7. 2. J. F. Woodhull: The significance of the new requirements in physics of the College entrance examination board, p. 8–16. 3. N. H. Black: The board's new definition in physics, p. 17–21. 4. G. H. Browne: The college examination in English as a test of power, and marking examination papers in English, p. 22–27. 5. Percival Chubb: College entrance requirements in English, p. 28–35. 6. D. V. Thompson: Two of the pupils' needs, p. 36–38. 7. F. S. Curtis: Teaching boys about matters of sex, p. 40–46. 8. R. C. Newton: Sexual purity, p. 47–54. 9. W. H. Eddy: Sex education in a public school, p. 55–63 (Discussion, p. 64–68).

162. **South Carolina state teachers' association.** The proceedings of the thirty-seventh annual meeting, held at Columbia, S. C., Dec. 30, 31, 1908 and Jan. 1, 1909. Abbeville, S. C., Press and banner print, 1909. 41 p. 8°. (E. C McCants, secretary, 1910–11, Anderson, S. C.)

Contains: 1. L. T. Baker, president: Address, The responsibility of the association to the public school system, p. 3–9. 2. W. H. Hand, chairman: Report of Committee on county associations, p. 9–11. 3. W. K. Tate, chairman: Report of Committee on status of the teaching profession in South Carolina, p. 11–19. 4. J. I. McCain: Simplified spelling, p. 20–24. 5. W. Burdell: Public schools and public health, p. 32–37.

163. **South Dakota educational association.** Proceedings of the twenty-seventh annual session held at Lead, November 1-2-3, 1909. Pierre, S. D., The Executive Committee [1909?] 202 p. 8°. (Nina M. Nash, secretary, Aberdeen, S. D.)

Contains: 1. F. L. Cook: Waste in education, p. 27–34. 2. H. A. Ustrud: Annual address, p. 34–38. 3. Eugene Davenport: Industrial education in agricultural communities, p. 38–44. 4. C. G. Lawrence: Industrial education for the rural schools, p. 44–50. 5. T. B. Thompson: Industrial education in Germany, p. 51–65. 6. B. T. Washington: Address, p. 66–68. 7. G. G. Wenzlaff: The field and function of the normal school, p. 70–75. 8. Alexander Strachan: Some imperfectly recognized rights of the student, p. 75–79. 9. S. F. Kerfoot: Standards of efficiency in collegiate education, p. 79–91. 10. A. A. McDonald: Some things that enter into efficient secondary education, p. 92–96. 11. J. C. Blyman: The aim and spirit of high school science, p. 97–99. 12. N. C. Hirschby: Waste in secondary and collegiate education, p. 100–8. 13. J. E. Johnson: Present possibilities of the rural schools, p. 110–16. 14. Miss C. M. Voight: School attendance, plans and experience, p. 116–19. 15. M. M. Ramer: The new compulsory school law, p. 119–24. 16. W. A. Burk: Manual arts for the primary and grammar grades, p. 124–34. 17. E. C. Evans: The retarded pupil, causes and remedies, p. 135–39. 18. Cornelia Stormen: History in the lower grades, p. 139–47. 19. N. P. Lang: The essentials of arithmetic, p. 148–50. 20. Charlotte Bartleson: The ideal story, p. 152–56. 21. Jessie Beebe: The ideal story teller, p. 156–57. 22. Elin Youngstrom: Drawing in the primary grades, p. 158–61. 23. Miss M. E. Wright: What the kindergarten does for the primary teacher, p. 161–66. 24. Adella Beach: What kindergarten training does for the child, p. 167–72. 25. Lucia Watson: Seat work for the country teacher, p. 173–77. 26. L. A. Fell: President's annual address, p. 192–96. 27. Eugene Davenport: Outline of four years work in high school agriculture, p. 197–202.

164. **Southern California teachers' association.** Committee on resolutions. Declaration of principles. Sierra educational news and book review, 6 : 42–46, January 1910.

165. **Tennessee public school officers' association.** Proceedings of the twenty-third annual session, Senate chamber, Nashville, January 11, 12, 13, 1910. Clarksville, Tenn., W. P. Titus, printer and binder, 1910. 129 p. 8°. (P. L. Harned, secretary, Clarksville, Tenn.)

Contains: 1. W. S. Jones, president: Address, p. 25–32. 2. Virginia P. Moore: School improvement work, p. 33–39. 3. W. E. Stephens: School improvement associations, p. 40–41. 4. V. S.

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Bright: What is our obligation as teachers, p. 42–46. 5. H. H. Clark: Corn clubs, p. 47–56. 6. S. G. Gilbreath: The course of study in the elementary schools, p. 57–62. 7. G. R. McGee: Normal course of study, p. 63–66. 8. E. H. Boyd: The function of the county superintendent, p. 67–69. 9. Ella Snodgrass: Libraries—how to raise local funds, p. 70–76. 10. A. E. Booth: How to use the library, p. 77–83.

166. **Vermont state teachers' association.** Report of the fifty-ninth annual convention, held in Rutland, October 15, 16 and 17, 1908. Rutland, Vt., The Tuttle co., printers [1909?] 121 p. 12°. (A. H. Harriman, secretary, 1909–10, Middlebury, Vt.)

Contains: 1. P. R. Leavenworth, president: Address, p. 17–28. 2. Gertrude Edmund: The moral training of the teacher, p. 28–39. 3. A. W. Edson: The modern school; its strength and weakness, p. 42–47. 4. Mary Tewksbury: Ancient history, p. 49–56. 5. Harriet Towne: Aims and methods of teaching mediaeval and modern history, p. 56–71. 6. G. S. Wright: Practical mathematics for grammar grades, p. 79–84. 7. Amy Drake: Mental arithmetic—aims and methods, p. 84–89. 8. J. P. Haney: The value of manual training in our public schools, p. 91–103. 9. Edith M. Wills: Scientific temperance instruction in the public schools, p. 103–6.

167. **Virginia state teachers' association.** Annual proceedings, 1908–1909. Announcements, Virginia educational conference Richmond, November 23–26. [Richmond ? 1908?] 96 p. 8°. (Algar Woolfolk, secretary, Courtland, Southampton county, Va.)

Contains: 1. J. D. Eggleston, jr.: The educational progress of the year, p. 28–34. 2. G. H. Lamar: Address, p. 35–40. 3. J. H. Saunders, president: Annual report, p. 41–45. 4. J. H. Saunders: Address to the Maryland teachers' association, p. 46–49. 5. F. W. King: Teachers' retirement fund, p. 50–51.

168. **Washington educational association.** Addresses and proceedings of the twenty-third annual session, Tacoma, December 28–30, 1909. Seattle, Washington, Northwest journal of education, publishers [1910] 224 p. 8°. (O. C. Whitney, secretary, Tacoma, Wash.)

Contains: 1. W. E. Wilson, president: Address, p. 16–20. 2. S. B. McCormick: The nation's challenge to the school, p. 21–35. 3. F. F. Bunker: The reorganization of our school grades, p. 36–42. 4. O. S. Jones: Progress in education in the state of Washington, p. 43–49. 5. N. D. Showalter: Our rural schools: their improvement, p. 49–53. 6. Mary Carpenter: The relation of the grade teacher to the success of the high school, p. 54–61. 7. F. A. Osborn: Side entrance and exits to the high school, p. 61–64. 8. J. H. Morgan: The work of the educational council, p. 67–69. 9. Frank Deerwester: What can be done for the raising of the professional status of the teacher now by preparation, p. 70–73. 10. H. B. Dewey: The professional status of the teacher: what can be done to raise it? Certification, p. 73–75. 11. Mary P. Carpenter: Tenure, p. 76–78. 12. A. H. Yoder: The professional status of the teacher; how raised by a scheme of annuities or pensions, p. 78–82. 13. N. F. Coleman: Professional ethics and esprit du corps, p. 82–84. 14. F. S. Thompson: Some reasons for partial failure in the development of the more important elements of manhood, p. 86–91. Estelle Purinton: Discussion, p. 91–92. 15. E. E. Cave: Bulwarking American institutions by practical civic training in our public schools. Fundamental principles in education, p. 93–104. 16. A. H. Smith: The differentiation of the course in physics for boys and girls, p. 106–8. 17. G. P. Rigg: What should constitute a high school course in botany, p. 109–21. 18. G. P. Senter: Some difficulties in the teaching of chemistry in the high school, p. 122–25. 19. H. B. Dewey: Rural school problem, p. 127–29. 20. A. S. Burrows: Summary of rural needs, p. 130–32. 21. S. S. Busch: To what degree is the normal able to meet the needs of the rural schools? p. 133–35. 22. Almina George: The adaptability of the normal graduate to the rural schools, p. 135–38. 23. Josephine Preston: The rural teacher: the adaptability of the normal graduate to this work, p. 139–41. 24. E. J. Klemme: How may the normal trained teacher be induced to teach in the rural schools? p. 142–45. 25. J. O. Mattoon: How may the normal trained teacher be induced to teach in the rural schools? p. 146–49. 26. Emma H. Koller: Training of the child voice, p. 151–54. 27. Marcella Nachtman: The problem of introducing music, p. 155–58. 28. C. D. Webster: A problem in design, p. 160–65. 29. Nellie Barnett: The home economics movement, p. 166–77. 30. F. W. Morrison: Solution of equations, p. 179–80. 31. C. A. Isaacs: Modern geometry of the triangle, p. 181–83. 32. Mrs. R. E. Friars: History of mathematics in the high school, p. 183–87. 33. Mable Buland: The correlation of composition and literature in high school English, p. 190–93. 34. B. J. Uhl: The place of conversation and composition in high school German, p. 194–98. 35. E. Shorrock: The management of school board affairs, p. 200–4. 36. J. O. Peterson: Penmanship and the pupil, p. 209–13. 37. Stephen Dwan: The teaching of commercial subjects in the high school, p. 214–17. 38. C. F. Beutel: The business college and the teacher, p. 218–21.

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169. **West Virginia university. Educational conference.** Proceedings and papers of the seventh annual educational conference, held at West Virginia university, June 25 and 26, 1909. [Morgantown] The University, 1909. 51 p. 8°. (West Virginia. University. Bulletin, series 9, no. 6) (Laura F. Lewis, secretary, Fairmont, W. Va.)

Contains: 1. J. N. Deahl: Professional education for teachers in the normal schools, p. 8–9. 2. C. G. Doney, C. R. Murray: Professional education for teachers in the private and denominational schools, p. 9–11, 11–13. 3. L. B. Hill, S. P. Hatton: Professional education for teachers in the university, p. 14–16, 17–18. 4. W. B. Taylor: Professional training for preachers, p. 18–21. 5. Maxwell Adams: Education in manual training, p. 21–25. 6. Neva A. Scott: Education in domestic science, p. 25–32. 7. T. F. Burk: Commercial education, p. 32–35. 8. J. P. Lawrence: Musical education, p. 35–36. 9. L. F. W. Hildner: Education for engineers. Mechanical engineering, p. 36–39. 10. W. H. Boughton: Education for engineers. Civil engineering, p. 39–44. 11. W. E. Dickinson: Education for engineers. Electrical engineering, p. 44–48. 12. J. W. Knowlton: Education for engineers. Mining engineering, p. 48–51.

170. **Wisconsin teachers' association.** Proceedings of the fifty-sixth annual session, held at Milwaukee, November 12 to 14, 1908. Madison, Wis., Democrat printing company, state printers, 1909. viii, 220 p. 8°. (Katherine R. Williams, secretary, Fifteenth district school no. 2, Milwaukee, Wis.)

Contains: 1. J. F. Woodhull: How the public will solve our problems of science teaching, p. 13–17. 2. E. A. Ross: The shortcomings of history, p. 36–38. 3. R. H. Butler: Shorthand in the high school, p. 40–42. 4. W. A. Scott: Relation of the commerce course at the university to the high schools, p. 42–44. 5. R. P. Kelley: Recent growth in the use of shorthand in the high school curriculum, p. 44–46. 6. Mary D. Bradford: Primary reading: p. 50–52. 7. J. F. Riordan: Course of study, p. 53–54. 8. Neale S. Knowles: The influence of domestic science on good citizenship, p. 55–56. 9. Laura L. Colman: A more uniform course of study, p. 56–57. 10. George Wittich: Folk-dances as physical training for the young in America, p. 60–62. 11. W. L. Bodine: The naughty boy; truancy and its remedies, p. 63–66. 12. S. B. Tobey: The teachers' point of view, p. 69–71. 13. L. A. Bacon: The manual training course of study, p. 101–6. 14. J. A. H. Keith: The great ways of learning, p. 112–19. 15. L. H. Gulick: The health of the child, p. 119–27. 16. H. C. Buell, president: Annual address, p. 127–31. 17. S. L. Heeter: Education of the hand and the head, p. 132–38. 18. G. H. Landgraf: Needed city school legislation, p. 138–45. 19. C. H. Hemingway: Needed legislation for rural schools, p. 145–54. 20. R. C. Denison: The teacher and the state, p. 154–60. 21. L. D. Harvey, chairman: Report of the committee on the constitutional amendment changing the minimum school age from four to six years, p. 160–64. 22. J. W. Olsen: The county superintendency and its place in our educational system, p. 165–70. 23. C. P. Cary: The heart as a factor in education, p. 170–76.

ASSOCIATIONS, SOCIETIES, CONFERENCES, ETC.—FOREIGN

(A list of British societies with officers and brief sketch of each is found in the Schoolmaster's Yearbook for each year.)

171. **Association of head mistresses.** *See* 1464.

172. **British association for the advancement of science. Educational section.** Program at Winnipeg, August 1909. Science, n. s. 30 : 109, July 23, 1909.

173. **Bund deutscher taubstummenlehrer.** *See* 1510.

174. **National education association.** Annual report for the year ending December 31st, 1909. London [Co-operative printing society limited, 1910] 32 p. 8°. (No. 165)

175. **Ontario educational association.** Proceedings of the forty-eighth annual convention, held in Toronto on the 13th, 14th and 15th of April, 1909. Toronto, Warwick bro's & Rutter, limited, 1909. 431 p. 8°. (R. W. Doan, general secretary, Toronto)

Contains: 1. W. H. Ballard: President's address, p. 80–88. 2. Charles DeGarmo: Some modern ideas in education, p. 91–105. 3. Charles DeGarmo: Problem form of instruction, p. 109–21. 4. A. H. Colquhoun: Address, p. 121–28. 5. U. J. Flach: Secondary schools of England with special reference to the scope, character, and methods of teaching mathematics, p. 129–37. 6. W. J. Sykes: Secondary schools of Great Britain, p. 137–43. 7. Baron Nettelbladt: Address in German,

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p. 144-52. 8. Carl Lehmann: Science teaching in German secondary schools, p. 174-82. 9. J. Matheson: A view of education applied to geometry, p. 183-90. 10. A. McVicar: History and Canadian citizenship, p. 191-97. 11. W. E. Macpherson: Supplementary reading in the lower school, p. 198-204. 12. W. J. Sykes: English literature for junior matriculation and entrance to normal schools, p. 205-8. 13. Clara Brenton: [Kindergarten department] President's address, p. 251-7. 14. Lillian B. Harding: The educational value of stories, p. 257-61. 15. Ida Hillman: The influence of good pictures, p. 261-66. 16. S. J. Radcliff: History in the public schools, p. 267-72. 17. J. R. Seavey: Why we teach art in the public schools, p. 272-82. 18. G. K. Mills: Departmental aid to teachers, p. 283-87. 19. Arthur Brown: Exemption from examination upon the teacher's recommendation, p. 287-93. 20. H. H. Burgess: Fifth classes in rural schools, p. 293-96. 21. N. W. Campbell: A compulsory attendance act, p. 296-303. 22. A. McPhedran: Medical inspection of schools, p. 304-10. 23. S. Truman: Military training in the schools, p. 311-17. 24. Robert McKnight: Our public schools then and now, with a glance at what may be anticipated in the future, p. 318-23. 25. W. T. Wilkins: Might not a larger place be profitably assigned in our educational system to night schools and evening classes? p. 323-30. 26. J. E. Farewell: How the teacher and trustee can supply material for local history, p. 330-37. 27. J. B. Dow: Rhodes scholarships, p. 337-42. 28. J. E. Hett: The benefits derived from physical training and medical inspection, p. 342-48. 29. T. A. Reid: The state and its primary schools, with some present problems, p. 348-59. 30. Miss A. L. Laird: English household science training schools, p. 361-65. 31. J. Roberts: The relation of teacher and nurse to medical inspection, p. 366-77. 32. J. H. Elliott: Education in hygiene—a means to protect the home and household from tuberculosis, p. 384-91. 33. Edward Faw: Connecting the kindergarten and manual training, p. 404-12. 34. A. N. Scarrow: Manual training from a mechanic's viewpoint—design and construction, p. 413-20.

176. **Parents' national educational union.** *See* 1187.

ASSOCIATIONS, SOCIETIES, CONFERENCES, ETC.—INTERNATIONAL

177. **International kindergarten union.** *See* 514, 515.

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Contains: 1. Educational boards and commissions, p. 33-52. 2. Educational associations, conferences, etc., p. 52-87. 3. Standardization of education, p. 99-105. 4. Aid to students, p. 106-8. 5. Public schools, p. 110-14. 6. Training of teachers, p. 114-16. 7. Teachers' tenure, salaries, pensions, etc., p. 117-21. 8. Departments and branches of study, p. 122-37. 9. Agricultural education, p. 137-50. 10. Industrial training, p. 150-75. 11. Home economics, p. 175-78. 12. Co-education of the sexes, p. 178-86. 13. International congresses, p. 187-203. 14. International education relations (including Chinese students in United States), p. 203-22. 15. Health and hygiene, p. 222-27. 16. Compulsory education and child labor laws, p. 228-33. 17. Education of the colored race, p. 234-39. 18. C. S. Foos: State educational associations, p. 251-74. 19. Education in Hawaii, p. 275-77. 20. Education in the Philippines, p. 279-309. 21. Education in Porto Rico, p. 311-22. 22. L. S. Rowe: Educational progress in the Argentine Republic and Chile, p. 323-62. 23. Education in Great Britain and England, p. 363-94. 24. Education in Scotland, p. 394-401. 25. Education in Ireland, p. 401-3. 26. Education in France, p. 405-44. 27. Education in Central Europe, p. 445-501. 28. E. M. Goldsmith: Schools for crippled children abroad, p. 503-11. 29. John Fryer: The educational reform in China, p. 513-21.

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250. **Benton, Guy Potter.** The real college. Cincinnati, Jennings and Graham; New York, Eaton and Mains [1909] 184 p. 12°.

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253. **Foster, William Trufant.** The American college on trial. School review, 17: 330–43, May 1909.

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257. **Reeve, Arthur B.** Our new college presidents. Munsey's magazine, 42: 155–64, November 1909.

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An account of present conditions at these universities; their administration, policies, traditions, and student life. Originally published as a series of articles in the Independent, 1909–10.

260. **Snedden, David.** The achievements and shortcomings of the American college. School review, 18 : 384–94, June 1910.

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261. **Tombo, Rudolf, *jr*.** The geographical distribution of the student body at a number of universities and colleges. [New York, 1909] 8 p. 4°. Reprinted from Science, n. s. 30 : 427–35, October 1, 1909.

Tabulates and interprets statistics showing the geographical distribution of the student body of twenty-one American universities, five New England colleges for men, five colleges for women, two technological schools, and one Pennsylvania college and engineering school for men, for the academic year 1908–9, the summer session students being in every case omitted.

"The number of foreign students at American institutions of learning is rapidly on the increase, and it is safe to say that the day is not very far distant when there will be more German students at American universities than American students at German universities."

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265. **Argentine Republic. Consejo nacional de educacion.** La jura de la bandera; crónica de las ceremonias realizadas en los xiv distritos escolares de la capital, 8 de Julio de 1909. Buenos Aires, Est. tipografico El Comercio, 1909. 74 p. 8°.

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270. **Detroit. Board of education.** Detroit teachers' visit to British and German schools. *In* Sixty-sixth annual report of the Board of education, 1909. p. 74–194.

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271. **Friedel, V. H.** La pédagogie dans les pays étrangers. Problèmes et solutions. Obligation scolaire et postscolaire. Préparation professionelle des instituteurs. Médecins scolaires. Tribunaux pour enfants criminels. Paris, G. Roustan, 1910. 330 p. 16°.

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274. **Aldrich, Louise.** The British school system. Popular educator, 27 : 397–401, April 1910.

275. **Branson, E. C.** English schools; report of a visit to them. Educational foundations, 21: 595–606, June 1910.

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276. **Educational settlement committee. Executive committee.** Towards educational peace; a plan of re-settlement in English elementary education. London, New York [etc.] Longmans, Green, & co., 1910. 59 p. 4°.

The object of the Committee is to promote and maintain religious teaching as an integral part of the national system of education, and to work on non-party lines for an educational settlement which will respect all forms of conscientious belief.

277. **Hamer, Frederick E.** The education controversy. A critical and historical review. London, James Clarke & co., 1909. 44 p. 8°.

278. **Hoban, Charles F.** American teachers' visit to Great Britain and Ireland. Pennsylvania school journal, 58 : 149–53, October 1909.

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279. **Kerr, John.** Scottish education; school and university, from early times [12th century] to 1908. Cambridge, University press, 1910. 442 p. 8°.

"In this volume we find everywhere evidence of the sound common sense of the experienced official, even in the purely historical parts. . . . His aim has obviously been to prepare a standard work of reference in the history of Scottish education, and in order to make it quite up to date he has entrusted certain of the quite new developments to specialists, who make an excellent showing in their respective sections."—Journal of education (London) June 1910, p. 413.

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281. **Leather, Herbert.** Some educational experiments in England. Journal of education, 70 : 144–45, August 19, 1909.

282. **Watson, Foster.** The beginnings of the teaching of modern subjects in England. London, I. Pitman & sons, ltd., 1909. 555 p. 12°

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603. **Allison, Andrew.** Nature study in the one-teacher school. Mississippi school journal, 14 : 1–3, March 1910.

604. **Bailey, Liberty H.** The nature-study idea; an interpretation of the new school-movement to put the young into relation and sympathy with nature. 3d ed., rev. New York, The Macmillan company, 1909. 246 p. 12°.

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619. **Gray, John C.** Number by development; a method of number instruction—primary. Philadelphia and London, J. B. Lippincott company [1910] 244 p. 12°.

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627. **McGaw, Virginia.** Construction work for rural and elementary schools. Chicago, A. Flanagan company [1909] 125 p. 12°.

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[*See also* Backward children.]

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1220. **Hart, Joseph Kinmont.** A critical study of current theories of moral education. Chicago, The University of Chicago press, 1910. 48 p. 8°.

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1222. **Leclère, Albert.** L'éducation morale rationnelle; ouvrage précédé d'une préface de Luigi Luzzatti. Paris, Hachette et cie., 1909. xii, 292 p. 12°.

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1279. **American school peace league.** First annual report, October 1909. Boston [1909] 52 p. 8°. (Mrs. Fannie Fern Andrews, secretary, 405 Marlborough st., Boston, Mass.)

The American school peace league was organized in 1908, "to promote, through the schools and the educational public of America, the interests of international justice and fraternity."

Contains: 1. N. M. Butler: The international peace movement, p. 36–37. 2. J. M. Greenwood: Saving nations from themselves, p. 38–47. 3. W. F. Gordy: Teaching peace in the schools through instruction in American history, p. 48–52.

1280. **Lake Mohonk conference on international arbitration.** Report of the fifteenth annual meeting, May 19, 20 and 21, 1909. [New York & Boston] Lake Mohonk conference on international arbitration, 1909. 208 p. 8°. (H. C. Phillips, corresponding secretary, Mohonk Lake, N. Y.)

Contains: 1. P. S. Moxom: What practical education can do for peace, p. 115–16. 2. A. D. White: The colleges and international arbitration, p. 129–30. 3. A. D. White: Report of committee on colleges and universities, p. 130–32. 4. List of colleges and universities co-operating with the Lake Mohonk conference, p. 132–37. 5. W. H. P. Faunce: How we may educate for peace, p. 137–41. 6. L. L. Hobbs: Colleges in their relation to arbitration, p. 143–46. 7. F. C. Bray: Home education regarding the friendship of nations, p. 174–80.

1281. **Fess, S. D.** The influence of the public school for the peace of the world. Ohio educational monthly, 59 : 216–19, May 1910.

1282. **Ginn, Edwin.** An international school of peace. Journal of education, 70: 399–400, October 21, 1909.

Reprinted from Nation, 89: 275–76, September 23, 1909.

1283. **Macnaughton,** *Mrs.* **Myra I. (Kelly)** The American public school as a factor in international conciliation. New York city, American association for international conciliation, 1909. 11 p. 12°. (International conciliation, November 1909, no. 24)

Also in Kindergarten-primary magazine, 22 : 169–70, 177–78, January, February 1910.

1284. **Nasmyth, George W.** The peace movement in the colleges. Independent, 68 : 362–65, February 17, 1910.

1285. **Wylie, F. J.** Cecil Rhodes and his scholars as factors in international conciliation. New York city, American association for international conciliation, 1909. 14 p. 12°. (International conciliation, December 1909, no. 25)

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IV. TYPES OF EDUCATION

HUMANISTIC EDUCATION

1286. **Classical conference,** *Ann Arbor, Mich.*, 1909. The value of humanistic, particularly classical, studies as a training for men of affairs; a symposium from the proceedings of the Classical conference held at Ann Arbor, Michigan, April 3, 1909. [Chicago? 1909] 40 p. 8°. (University bulletin. new ser., vol. x, no. 21)

"Reprint from the School review, June, September 1909."

CONTENTS.—Letters [by] James Bryce, James Loeb, William Sloane.—The study of the classics as a training for men of affairs [by] J. W. Foster.—The study of Latin and Greek as a training for practical life [by] C. R. Williams.—The value of the study of Greek and Latin as a preparation for the study of science [by] H. W. Wiley.—The classics and modern life [by] J. B. Scott.

As a member of the Committee of nine of the Classical association of the Middle West and South, Dr. Wiley sent "a circular letter to one hundred prominent scientific men in the United States, teachers, and others, for the purpose of eliciting information respecting their attitude toward the promotion of classical learning and their estimation of its value." The replies are contained on pages 26–32 of Dr. Wiley's paper.

1287. **Benson, Arthur C.** Humanistic education without Latin. Cornhill magazine, 101 : 229–35, February 1910.

A paper read at the Cambridge meeting of the Modern language association. Reply by W. H. D. Rouse, entitled "Humanistic education not without Latin," Cornhill magazine, 102 : 45–50, July 1910. Both articles reprinted in Living age, 264 : 737–42, March 19, 1910; 266 : 433–37, August 13, 1910.

1288. **Edmiston, Homer.** A classical education in America. Atlantic monthly, 104 : 260–73, August 1909.

1289. **Lebrun, Hector.** Moins de Grec et de Latin! Plus de sciences naturelles!! Bruxelles, Misch & Thron; Paris, Marcel Rivière, 1910. 71 p. 16°.

1290. **Snow, T. C.** How to save Greek and other paradoxes of Oxford reform. Oxford, B. H. Blackwell, 1910. 86 p. 12°.

1291. **Storr, F.** Humanistic education without Latin. Journal of education (London) n. s. 32 : 101–3, February 1910.

A paper read at the Cambridge meeting of the Modern language association.

1292. **Zielinskiĭ, Faddeĭ Frantsevic.** Our debt to antiquity; tr., with introduction and notes, by H. A. Strong and H. Stewart. London, G. Routledge & sons; New York, E. P. Dutton & co., 1909. xvi, 240 p. 16°.

"Lectures delivered by Professor Zielinskiĭ of St. Petersburg university in the spring of 1903 to the highest classes of the secondary schools in the capital."

VOCATIONAL EDUCATION

1293. **Boston. Superintendent of public schools.** Boston public schools. Annual report of the superintendent. (Stratton D. Brooks, superintendent) Boston, Printing department, 1910. 157 p. plates. 8°. (School document no. 10, 1910)

Exhibiting especially situation with regard to vocational education and vocational direction.

1294. **Bustico, Guido.** L'educazione vocazionale e la scuola. Desenzano, F. Legati e c., 1909. 16 p. 8°.

1295. **Dean, Arthur D.** Vocational education; a reprint from the Annual report of the Education department, submitted January 1910. Albany, New York State Education department, 1910. 26 p. 8°.

1296. **Dodd, Alvin E.** Better grammar grade provision for the vocational needs of those likely to enter industrial pursuits. Manual training magazine, 11 : 97–109, December 1909.

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1297. **Flexner, Mary.** A plea for vocational training. Survey, 22 : 650–55, August 7, 1909.

Based on a study of one thousand children who left school to work.

1298. **Gillette, John Morris.** Vocational education. New York, Cincinnati [etc.] American book company [c1910] vii, 303 p. 12°.

"An interesting, but not particularly profound book, in which he sets out in summary form the development of vocational training and its many manifestations in modern and contemporary life and thought. The book is suggestive rather than satisfying."—Educational review, December 1910, p. 536.

1299. **Henderson, C. Hanford.** What is fundamental in vocational education? Sloyd record, no. 13 : 8–18, February 1910.

1300. **High school teachers association of New York City.** Choosing a career; a circular of information for boys. New York, Students' aid committee [1909] 22 p. 8°.

1301. ——— Choosing a career; a circular of information for girls. New York, Students' aid committee [1909] 26 p. 8°.

1302. ——— Students' aid committee. Directing young people in the choice of a vocation. [Brooklyn, N. Y.] Printed for the Student's aid committee [1910] 16 p. 8°.

1303. **Lodge, Thornton H.** Vocational subjects in the secondary school. Educational review, 39 : 333–41, April 1910.

1304. **McKeever, William A.** Assisting the boy in the choice of a vocation. Manhattan, Kans., 1909. 15 p. 8°. (The Industrialist, v. 35, no. 41, June 26, 1909)

1305. **Miller, William T.** Vocation-teaching. Atlantic monthly, 104 : 644–47, November 1909.

1306. **Mittenzweh, L.** Die berufswahl. Leipzig, Dürr, 1910. xv, 217 p. 8°.

1307. **Monaghan, J. C.** Vocational training and the manufacturer. American school board journal, 39 : 6–7, September 1909.

1308. **Rapp, Eli M.** Vocational possibilities in country schools. [Harrisburg? 1909] 14 p. 8°.

1309. **Snedden, David.** The movement for vocational education and its probable effects on liberal education. American education, 13 : 252–55, 300–4, February, March 1910.

1310. ——— The problem of vocational education. Boston, New York [etc.] Houghton Mifflin company [1910] vi, 86 p. 12°. (Riverside educational monographs, ed. by H. Suzzallo)

A concise but comprehensive survey of present conditions and prospects in this important educational field, by an authority of national reputation.

1311. **Webster, Homer J.** Breadth in education and the choice of a career. Ohio educational monthly, 58 : 485–88, September 1909.

MANUAL TRAINING

1312. **Eastern manual training association.** Proceedings, fifteenth annual convention, held at Business high school, Washington, D. C., April 13, 14, 15, 1908. [Springfield, Mass., The F. A. Bassette company] 1908. 122 p. 8°. (Irene E. McDermott, secretary, Allegheny, Pa.)

Contains: 1. J. C. Park: Fundamental principles of manual training, p. 15–18. Discussion, p. 19–21. 2. W. J. De Catur: The content of the course of study for the grades and high school, p. 22–25. 3. G. E. Myers: Correlation based on social and individual needs, p. 26–31. Discussion, p. 32–34. 4. A. E. Dodd: Hand work training for the normal student, p. 42–48. 5. T. D. Sensor: The needs of rural schools, p. 55–61. 6. Mrs. Ada Williams: The social value of domestic science training, p. 77–80. 7. Sarah E. Bowers: Aims of domestic science in the elementary schools, p. 81–86.

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1313. **Western drawing and manual training association.** Proceedings of meeting held at Central high school, Saint Louis. Sixteenth annual report, 1909. [Bloomington, Ill., Pantagraph ptg. and sta. co., 1910] 208 p. 8°.

Contains: 1. C. H. Walker: Art in education, p. 17–27. 2. J. S. Ankeney: The place and scope of art education in the university, p. 28–35. 3. H. Smith: Art as an integral part of university work, p. 36–39. 4. F. O. Sylvester: Esthetic and practical values in art courses, p. 40–45. 5. E. H. Wuerpel: The art school as a factor in community progress, p. 46–47. 6. F. M. Mann: Cooperation among art workers in universities, p. 48–50. 7. E. H. Wuerpel: The relation of the art school to the university, p. 51–53. 8. Janette Reitler: Art from the standpoint of the normal school, p. 54–56. 9. L. S. Silke: Color training in the schools, p. 57–65. 10. Jeanette Buckley: The aims of the art teacher, p. 66–67. 11. E. A. Batchelder: The study and practice of design, p. 68–73. 12. E. D. Day: The socio-economic value of domestic art in the education of future home makers, p. 87–92. 13. C. M. Gibbs: Preparation necessary for a teacher of domestic arts, p. 93–100. 14. K. F. Steiger: The place of the study of clothing in the life of a girl, p. 101–3. 15. C. M. Gibbs: Household arts in the grades, p. 105–8. 16. C. M. Woodward: History and influence of the manual training movement, p. 122–30. 17. C. F. Perry: Trade teaching in the public schools, p. 131–42. 18. Ida H. Clark: The working out of the arts in the schools, p. 151–53. 19. L. W. Wahlstrom: Controlling ideas in the working out of a course of study in the arts, p. 154–57. 20. Florence Ellis: The manual arts in the primary grades, p. 158–59.

1314. ——— Seventeenth annual report, Minneapolis, 1910. [Oak Park, Ill., Oak leaves company, 1910] 239 p. 8°.

Contains: 1. H. T. Bailey: How to study pictures, p. 17–29. 2. May Gearhart: The grade teacher's art problem, p. 30–35. 3. H. N. Winchell: Problems involved in the introduction of the industrial arts in the elementary schools, p. 36–42. 4. L. A. Bacon: Correlation of art and manual training in grade schools, p. 43–44. 5. H. Wood: The correlation of art and manual training in high schools, p. 45–51. 6. O. L. McMurry: Bookbinding in grade schools, p. 52–55. 7. W. Sargent: Fine and industrial art in public education, p. 56–62. 8. R. W. Selvidge: Industrial education from the viewpoint of organized labor, p. 63–74. 9. E. M. Church: Relative values of subjects in school courses of study, p. 76–80. 10. C. Reed: Creative picture study, p. 81–88. 11. A. F. Payne: The correlation of metal work and design in the grammar and high school, p. 90–94. 12. D. Upton: Is manual training worth while?, p. 95–100. 13. Mary S. Snow: Correlation of household arts with other subjects of the curriculum, p. 107–10. 14. A. P. Norton: Domestic science in public schools in relation to the pure food law, p. 111–15. 15. O. Heller: Art as a liberal study, p. 126–29. 16. J. Jastrow: The place of the study of art in a college course, p. 130–34. 17. Henriette Clopath: The scope and organization of art instruction in the A. B. course, p. 136–39. 18. H. R. Cross: The college degree in fine arts, p. 140–42. 19. H. Smith: The future of the university round table, p. 143–46. 20. C. A. Bennett: Some suggestive features of industrial education in Germany, p. 147–56.

1315. **Bailey, Henry Turner.** Instruction in the fine and manual arts in the United States; a statistical monograph. Washington, Government printing office, 1909. 184 p. 8°. (U. S. Bureau of education. Bulletin, 1909, no. 6)

"References to publications containing statistical data on instruction in the manual and fine arts": p. 182.

1316. **Bennett, Charles A.** Visiting manual training schools in Europe. I, II, III, IV, V. Manual training magazine, 11 : 1–26, 109–34, 214–36, 345–65, 440–55, October, December 1909, February, April, June 1910.

1. London. 2. Oxford and Birmingham. 3. Leicester and Sheffield. 4. Manchester and Leeds. 5. Glasgow and Edinburgh.

1317. **Berry, Thomas W.** The pedagogy of educational handicraft. London, Glasgow [etc.] Blackie & son limited, 1909. 100 p. 12°.

Bibliography: p. 97–100.

"Makes no pretence to originality, but gives in a small compass the utterances of eminent educationists on the subject and other practical information not easily accessible. Thus we have an estimate of the cost of materials and fittings for a workshop, examination questions for teacher's diploma, and a bibliography."—Journal of education (London) April 1910, p. 256.

1318. **Bhabha, H. J.** Special report on manual training in schools of general education. Bangalore, Government press, 1909. 145 p. illus. 8°.

1319. **Binns, Charles L.** *and* **Marsden, Rufus E.** Principles of educational woodwork, a handbook for teachers and others interested in education. London, J. M. Dent & co.; New York, E. P. Dutton & co. [1909] viii, 310 p. 12°.

"The teacher and his reading": p. 61–71.

Suggestions for teaching woodwork, with emphasis on the need that manual training teachers be as well equipped on the pedagogical side as teachers of other subjects.

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1320. **Boone, Cheshire Lowton.** A course of study in manual training—VII, VIII. Manual training magazine, 11 : 46–58, 410–17, October 1909, June 1910.

1321. ——— Pottery craft in schools. I, Equipment; II, Building processes; III, Design. School arts book, 9 : 118–26, 329–40, 925–34, October, December 1909, May 1910.

1322. **Clark, Ida Hood.** Manual arts in open air schools. School arts book, 9 : 1045–51, June 1910.

1323. **Davis, B. M.** The present status of manual training in its relation to industrial education in the rural schools. Manual training magazine, 11 : 456–61, June 1910.

1324. **Great Britain. Board of education.** Manual instruction in public elementary schools. London, Printed for H. M. Stationery off., by Eyre & Spottiswoode, 1910. iv, 34 p. 8°.

1325. **Noyes, William.** The ethical values of the manual and domestic arts. Manual training magazine, 11 : 201–13, February 1910.

1326. ——— Handwork in wood. Peoria, Ill., Manual arts press, 1910. 231 p. illus. 8°.

"General bibliography": p. 4–6.

1327. **Rathmann, Carl Gustav.** The mission of manual training; an address . . . before the graduating class of the Manual training school of Washington university, June 23, 1909. With an appendix containing the opinions of educators in England, Germany, Austria and Australia. [St. Louis] The Managing board of the school [1909] 23 p. 8°.

1328. **Reading, Pa. Board of education.** Report of superintendent on manual training. (C. S. Foos, superintendent.) *In its* Minutes, March 23, 1909. p. 34–72. *Also in its* Biennial report, 1907–1909, p. 514–50.

Contains synopsis of detailed information secured by means of a questionnaire sent to one hundred cities.

1329. **Row, Robert Keable.** The educational meaning of manual arts and industries. Chicago, Row, Peterson and company [1909] 248 p. 12°.

1330. **Sargent, Walter.** Place of manual arts in the secondary schools. School review, 18 : 99–107, February 1910.

1331. **Selden, Frank Henry.** The equipment of manual training departments in the public schools. American school board journal, 41 : 4–5, 30, July 1910.

1332. ——— [1] Manual training and industry. [2] Methods of instruction in manual training. [3] Our duty toward the manual training movement. American school board journal, 40 : 3, 28, January 1910; 3, 18, February 1910; 15–16, March 1910.

1333. **Sloan, Percy H.** The organization of the arts in the high schools. Educational bi-monthly, 4 : 182–90, February 1910.

1334. **Williams, S. Horace.** The educative value of manual training. I, II, III. Manual training magazine, 11 : 36–45, 158–67, 252–60, October, December 1909, February 1910.

INDUSTRIAL AND TRADE EDUCATION

1335. **National society for the promotion of industrial education.** A descriptive list of trade and industrial schools in the United States. Prepared by Edward H. Reisner. New York city, National society for the promotion of industrial education, August 1910. 128 p. 8°. (*Its* Bulletin, no. 11)

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1336. **National society for the promotion of industrial education.** Industrial education . . . Communication from C. R. Richards, president of the National society for the promotion of industrial education, transmitting reports by a committee of the society on the subject, together with resolutions urging upon Congress an appropriation to enable the Department of education to develop schools for industrial training . . . [Washington, Government printing office, 1910] 8 p. 8°. ([United States.] 61st Cong., 2d sess. Senate. Doc. 516)

1337. ——— Proceedings of the third annual meeting, Milwaukee, Wis., December, 1909. New York, National society for the promotion of industrial education, 1910. 204 p. 8°. (*Its* Bulletin, no. 10) (Edward H. Reisner, secretary, New York)

1338. ——— Report of the Committee of ten on the relation of industrial training to the general system of education in the United States. New York city, National society for the promotion of industrial education [1910] 16 p. 8°.

Includes Preliminary report of the Committee of ten, H. S. Pritchett, chairman, submitted at the second annual meeting of the Society, Nov. 19–21, 1908, and Final report, submitted at the third annual meeting, Dec. 2–4, 1909.

1339. ——— **New York State Branch.** Proceedings of the second annual convention, held at Rochester, N. Y., November 19, 1909. Brooklyn, N. Y., Guide printing and publishing company, 1910. 98 p. 8°. (Arthur L. Williston, secretary-treasurer, Brooklyn, N. Y.)

Contains: 1. J. F. McElroy: President's address, p. 7–8. 2. Rush Rhees: The national importance of industrial education, p. 9–17. 3. Mary S. Woolman: Industrial education for girls, p. 18–23. 4. E. G. Miner: Industrial education from the point of view of the manufacturer, p. 24–33. 5. P. M. Strayer: Industrial education from the point of view of the workman, p. 34–47. 6. Charles De Garmo: Industrial education in relation to race development, p. 48–57. 7. G. M. Forbes: The factory school of Rochester, p. 58–67. 8. A. D. Dean: Preparatory trade schools in other parts of New York State, p. 68–71. 9. C. W. Cross: The apprenticeship system of the New York Central lines, p. 78–86. 10. G. H. Vose: Industrial schools in Beverly, Mass., p. 91–98.

1340. **Alexander, Magnus W.** The training of men—a necessary part of a modern factory system. [New York, 1910] p. [33]–49. 8°.

Reprint from the Journal of the American society of mechanical engineers [January 1910].

1341. **American federation of labor.** Industrial education; consisting of an investigation and report by a competent special committee; reports of officers and committees; action of A. F. of L. convention; the attitude of organized labor and others toward the problem . . . 1st ed. Washington, D. C., American federation of labor, 1910. 68 p., 1 l. 8°.

1342. **American foundrymen's association. Committee on industrial education.** Report of Committee on industrial education . . . [n. p., 1909] 5–12 p. 8°.

P. Kreuzpointner, chairman.
Cincinnati convention, 1909.

1343. **Arnold, Sarah Louise.** The Sargent industrial school; a successful experiment in industrial training. Survey, 24 : 32–39, April 2, 1910.

1344. **Barney, Edgar S.** Industrial training of boys. American education, 13: 257–60, February 1910.

1345. **Brooks, Stratton D.** Industrial education. Journal of education, 70 : 597–99, 627–28, December 9, December 16, 1909.

1346. **Carman, George N.** Co-operation of school and shop in promoting industrial efficiency. School review, 18 : 108–14, February 1910.

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1347. **Dean, Arthur D.** Industrial education and a state policy; an address before the National society for the promotion of industrial education, Milwaukee, December 3, 1908, by Arthur D. Dean, chief, Division of trades schools, New York state education department. Albany, New York state education department, 1910. 16 p. 8°.

1348. ——— A state policy of promoting industrial education. Journal of education, 70 : 681–82, 71 : 6–7, 35–36, 62–63, 144–45, December 30, 1909, January 6, January 13, January 20, February 10, 1910.

1349. **Dooley, William H.** Practical education for industrial workers. Educational review, 38 : 261–72, October 1909.

1350. **Draper, Andrew S.** The necessary groundwork of industrial training. Journal of education, 70 : 568–69, December 2, 1909.

1351. **Eaton, James Shirley.** Education for efficiency in railroad service. Washington, Government printing office, 1909. 159 p. 8°. (United States Bureau of education. Bulletin, 1909, no. 10)

"After an extensive examination of the problem involved in the present day situation, Mr. Eaton proceeds to outline a scheme looking toward an improvement of present conditions."—Nation, April 21, 1910, p. 408–9.

1352. **Haese, Arthur.** Brief history of industrial schools in Germany, tr. by Bertha Reed Coffman. Manual training magazine, 11 : 418–25, June 1910.

1353. **Haney, James Parton.** The National society for the promotion of industrial education. Manual training magazine, 11 : 27–35, October 1909.

A brief review of the activities of the National society.

1354. Industrial training in the Philippine school of arts and trades and the Iloilo trades school. Philippine education, 6 : 12–16, February 1910.

1355. **Kimmins, C. W.** Trade schools in London. Elementary school teacher, 10 : 209–19, January 1910.

1356. **Kreuzpointner, Paul.** Constructive industrial education. American machinist, 33 : 343–44, August 25, 1910.

By the chairman of Industrial education committee, American foundrymen's association.

1357. ——— Industrial education: Germany vs. United States. Pennsylvania school journal, 58 : 219–22, November 1909.

1358. **Lovejoy, Owen R.** Will trade training solve the child-labor problem? North American review, 191 : 773–84, June 1910.

1359. **Magruder, William T.** Industrial education. Ohio educational monthly, 59 : 120–23, March 1910.

1360. **Maine. Committee on industrial education.** Report of the Committee on industrial education, 1910. Augusta, Kennebec journal print, 1910. 72 p. fold. diagr. 8°.

Contains report and recommendations of special committee created by the Legislature of 1909. To be found also as chapter I in annual report of the state superintendent for 1910.

1361. **Maryland. Commission on industrial education.** Report of the Commission to make inquiry and report to the legislature of Maryland respecting the subject of industrial education, 1908–1910. Baltimore, G. W. King printing co., state printers [1910] 121 p. illus. 8°.

1362. **National association of manufacturers of the United States of America. Committee on industrial education.** Report of Committee on industrial education; presented at the fourteenth annual meeting, New York, May 17, 18 and 19, 1909. [n. p., 1909] 19 p. 8°.

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1363. **National metal trades association.** Synopsis of proceedings of the twelfth annual convention, April 13–14, 1910, New York City. [n. p. 1910] 168 p. 8°. (Robert Wuest, commissioner, New England building, Cleveland, O.)

Contains: 1. W. B. Hunter: The Fitchburg plan of industrial education, p. 25–31. 2. Herman Schneider: Growth of co-operative system, p. 32–35. 3. F. B. Dyer: A plea for continuation schools, p. 36–41. 4. Report of Committee on industrial education, p. 42–45. 5. C. A. Bookwalter: Winona technical institute, p. 58–61. 6. J. H. Renshaw: Cincinnati's continuation school, p. 91–93. 7. D. S. Kimball: Industrial education, p. 161–64.

1364. **Orth, Samuel Peter.** Industrial education, an address . . . at the dedication of the Cleveland technical high school, April fifteenth, 1909. Cleveland, Printed at the Technical high school printshop [1909] 6 p. 8°.

1365. **Paddelford, Fred L.** Short addresses on Industrial training, The American boy (Handle with care); Thanksgiving; Industry the golden pass key. Golden, Colorado [The Industrial school press, 1909] [72] p. 24°.

1366. **Richards, Charles R.** Industrial training; a report on conditions in New York State. Albany, State dept. of labor, 1909. 394 p. 8°. (New York. Bureau of labor statistics. 26th Annual report for 1908, Part 1)

CONTENTS.—General summary.—Conditions of entrance and advancement in individual industries.—Attitude of labor unions toward industrial and trade schools.—Comments by employers on industrial training.—Rules and agreements of labor unions in regard to apprentices and helpers.—Laws of New York State relating to child labor, compulsory education, apprenticeship, and industrial education.—Institutions offering courses in industrial training in New York State.—Selected bibliography on industrial education.

1367. **Robinson, James Harvey.** The significance of history in industrial education. Educational bi-monthly, 4 : 376–89, June 1910.

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1368. **Scheer, Meyer.** Industrial work. Philippine education, 6 : 22–23, November 1909.

1369. **Schneider, Herman.** Fundamental principles of industrial education. [New York, ©1909] 307–16 p. 8°.

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1370. **Selden, Frank Henry.** Attitude of pupils in shop work. American school board journal, 39 : 5, December 1909.

1371. **Solvidge, Robert W.** Industrial education from the viewpoint of organized labor. American school board journal, 40 : 6–7, 27, June 1910.

1372. **Whitfield, H. L.** Industrial education. Mississippi school journal, 14 : 7–10, January 1910.

1373. **Wilson, B. N.** Industrial education as a business investment. American school board journal, 40 : 3, May 1910.

1374. **Woolman, Mary Schenck.** The making of a trade school. Boston, Whitcomb & Barrows, 1910. 101 p. 12°.

An account of the history, organization, and work of the Manhattan trade school for girls, New York city.

Public Schools

1375. **Ashmore, Sidney G.** A word on industrial education in the public schools. American education, 13 : 404–6, May 1910.

1376. **Bailey, Henry Turner.** Elementary schools as a factor in industrial education. Manual training magazine, 11 : 297–301, April 1910.

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1377. **Downing, Augustus S.** The meaning of industrial education to the elementary schools. School work, 8 : 353–57, February 1910.

1378. **Elliott, Edward C.** Industrial education; summary of legislation concerning industrial education in public elementary and secondary schools. [Madison, Wis., American association for labor legislation] 1909. 16 p. 8°.

1379. **Ferguson, James.** Industrial education in high schools. Sierra educational news, 5 : 28–35, November 1909.

1380. **Hanus, Paul H.** Public trade schools. A stenographic report of a commencement address delivered May 1909. (Bulletin of the Winona technical institute, August 1910.)

1381. **Hunter, W. B.** The Fitchburg plan of industrial education. School review, 18 : 166–73, March 1910.

1382. **Kent, Ernest B.** The elementary curriculum and the industries. Education, 30 : 582–90, May 1910.

1383. **National education association of the United States. Department of manual training.** Committee on the place of industries in public education. Report . . . July 1910. [n. p.] The Association, 1910. 123 p. 8°.

Selected bibliography on industrial education, p. 116–23.

1384. **Russell, James E.** The school and industrial life. Educational review, 38 : 433–50, December 1909.

1385. **Sargent, Walter.** The fine and industrial arts in elementary schools. Elementary school teacher, 10: 49–57, 110–20, 220–27, 287–300, 334–46, 415–26, 465–77, October, November 1909, January, February, March, May, June 1910.

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1387. **Warriner, Eugene Clarence.** Industrial and vocational training in the public schools. Published by the state superintendent of public instruction. [Lansing] 1909. 10 p. 8°. (Michigan. Dept. of public instruction. Bulletin no. 2. 1909)

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1392. **Maclaurin, Richard C.** The creed of the technical school. American college, 1: 119–23, November 1909.

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1393. **Rigillo, Michele.** La nuova scuola tecnica, secondo le riforme proposte dai proff. G. Salcemini e A. Galletti. Cagliari, Tipografia industriale, 1909. 49 p. 8°.

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Contains: 1. D. W. Working: What plan could be adopted by the institute for securing the introduction and continued maintenance the entire year of a movable school in each state and province? p. 38–40. 2. G. A. Putnam: The practicability and advisability of holding separate institutes for women and of organizing rural women's clubs, p. 40–42. 3. L. A. Merrill: What form of organization would be best adapted for women's institutes and rural clubs for women and how should the expenses of such clubs be met? p. 42–45.

1397. **Association of American agricultural colleges and experiment stations.** Proceedings of the twenty-third annual convention, held at Portland, Oreg., August 18–20, 1909. Edited by A. C. True, W. H. Beal and W. O. Thompson. Washington, Government printing office, 1910. 124 p. 8° (U. S. Department of agriculture. Office of experiment stations. Bulletin 228)

Contains: 1. A. C. True: Secondary education in the United States, p. 17–19. Discussion, p. 19–24. 2. L. H. Bailey: The better preparation of men for college and station work, p. 25–32. 3. L. G. Carpenter: Conservation of our natural resources, p. 32–34. 4. K. L. Butterfield: Report of Committee on extension work, p. 34–39. 5. A. C. True, chairman: Report of Committee on history of agricultural education, p. 40–41. 6. A. B. Storms: The distinctive work of the land-grant colleges: their function, scope, and organization, p. 51–57. Discussion, p. 57–65. 7. J. L. Snyder: Entrance requirements for land-grant colleges, p. 65–68. Discussion, p. 68–71. 8. Recommendations regarding extension work, p. 72–79. 9. H. J. Waters: The function of land-grant colleges in promoting collegiate and graduate instruction in agriculture outside of the course of the graduate school, p. 80–84. Discussion, p. 84–86. 10. E. A. Burnett: The function of the land-grant college in promoting agricultural education in secondary schools, p. 87–93. Discussion, p. 93–94. 11. E. J. Wickson *and* A. B. Cordley: How can agricultural colleges best serve farmers in solving rural problems? p. 94–96, 97–99. 12. E. Davenport *and* A. D. Selbey: Relation of the director to the members of the station staff, p. 100–2, 103–5. Discussion, p. 105–10.

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1402. **Brannon, Melvin A.** Higher education and the farm. Educational review, 38 : 451–60, December 1909.

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The United States Department of agriculture, p. 101–9. United States Bureau of education; state departments of education; state legislation, p. 163–76. Agricultural colleges, including extension work, departments of agricultural education, and summer schools for teachers, p. 277–86. State normal schools, p. 376–87. National education association; state and other teachers' associations, p. 444–52. Bibliography follows each article.

1405. **Draper, Andrew S.** Agriculture and its educational needs. Syracuse, N. Y., C. W. Bardeen, 190[9?] 92 p. 12°

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1406. Farm life as the basis of practical education. Craftsman, 16 : 243–45, May 1909.

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1411. **United States. Office of experiment stations.** Institutions in the United States giving instruction in agriculture. Washington [Government printing office] 1910. 15 p. 8° (U. S. Office of experiment stations. Circular no. 97)

1412. **Vuyst, Paul de.** L'enseignement agricole et ses méthodes. Bruxelles, A. Dewit, 1909. 354 p. 8°

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1413. **Waters, H. J.** The duty of the agricultural college. Science, n. s. 30 : 777–89, December 3, 1909.

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1417. **Harmant, Émile.** Les écoles ménagères, considérations générales, état actuel de l'enseignement ménager en Europe, et en particulier en Belgique. Desiderata en ce qui concerne ce dernier pays. Rapport présenté [au Congrès de Malines (septembre 1909)] Bruxelles, J. Goemaere, 1909. 27 p. 8°

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1418. Home science in various states of the Union. A series of articles in Good housekeeping. New York, by Mary R. Ormsbee, 50 : 3–11, January 1910; California, by Margaret M. Doyle, 50 : 225–31, February 1910; Illinois, by Edith B. Kirkwood, 50 : 602–9, May 1910; Massachusetts, by Frances Stern, 50 : 732–38, June 1910.

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Contains: 1. F. E. Turneaure: Recent developments and present tendencies in technical education, p. 19–38. 2. The teaching of mathematics to engineering students, The Chicago symposium, p. 39–44. E. V. Huntington: Preliminary report of the committee on the teaching of mathematics to students of engineering, p. 44–48. Discussion, p. 48–56. 3. L. W. Page: Highway engineering, p. 57–62. Discussion, p. 62–66. 4. C. B. Going: The relation of engineering education to industries p. 67–78. 5. F. W. Taylor: Why manufacturers dislike college students, p. 79–92. Discussion, p. 92–104. 6. L. E. Reber: University extension—"An instrument of the state in its upbuilding," p. 105–18. Discussion, p. 118–20. 7. Robert Fletcher: The five and six-year courses in engineering schools, p. 121–27. 8. W. T. Magruder: The five-year courses, p. 128–33. 9. Charles Derleth, jr.: The length of an engineering course, p. 134–41. Discussion on five and six-year courses, p. 142–71. 10. Hugo Diemer: Employers' requirements of technical graduates, p. 172–78. 11. M. E. Cooley and J. A. Moyer: Statistics of the graduates in engineering from the University of Michigan, p. 179–91. 12. W. K. Hatt: Regulations governing examinations, p. 192–200. Discussion, p. 200–7. 13. O. B. Zimmerman: Requisite qualifications of an engineering college instructor, p. 208–15. 14. Charles Derleth, jr.: The summer school problem, particularly for surveying and geodesy, p. 216–37.

1429. **Burr, William H.** Sanitary engineering at Columbia university. Columbia university quarterly, 11 : 469–71, September 1909.

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Contains: Art in the public schools, address by Elmer Ellsworth Brown, p. 50–54, followed by discussion, p. 54–59; Art education in the United States, by Walter Scott Perry, p. 132–40.

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Contains: 1. J. F. Hopkins: The international congresses on art education, p. 83–87. 2. T. L. Blayney: The history of art in the college curriculum, p. 96–103. 3. M. Carroll: Archeology as an educational factor in the popular appreciation of art, p. 109–12. 4. H. K. Bush-Brown: Art education, p. 112–17.

1432. **Eastern art teachers' association.** Proceedings, New York meeting of the Eastern art teachers' association, May 1908. Joint meeting of the Eastern art teachers' association and Eastern manual training association, Pittsburg, May 1909. [Newark, N. J., Printed by Baker printing company, °1910] 317 p. 8°. (C. L. Boone, editor, Montclair, N. J.)

Contains: 1. D. W. Ross: The teaching of art in the public schools. What it should be, p. 14–32. 2. H. W. Mable: The creative spirit in teaching, p. 33–48. 3. A. G. Randall: The duties and opportunities of the art supervisor as a citizen, p. 49–58. 4. Stella Skinner: Art teaching in normal schools, p. 59–69. 5. J. P. Haney: Pencil sketching from nature, p. 70–84. 6. Alicia M. Keyes: Experiments in connecting Boston schools with the museum of fine arts and with Fenway court, p. 85–91. 7. W. S. Perry: The study of historic ornament, p. 92–108. 8. M. B. Soper: Should art in the high school be for the talented few? p. 109–11. 9. Walter Sargent: Drawing in intermediate grades, p. 112–14. 10. J. W. Beatty: The relation of the institute to school work, p. 128–32. 11. A. A. Hammerschlag: The influence of arts and crafts on education, p. 133–36. 12. L. S. Thomson: Progressive snap-shot drawing, p. 137–43. 13. Kate C. Simmons: The English schools, p. 144–51. 14. Mary C. Wheeler: The third international congress, London, 1908, p. 152–71. 15. Annie B. Durfee: A justification for cookery in grammar schools, p. 172–74. 16. Helen Livingston: Cooking in the high school, p. 174–76. 17. Miss C. L. West: Domestic science, p. 177. 18. A. E. Dodd: Better grammar grade provision for the vocational needs of those likely to enter industrial pursuits, p. 177–92. 19. E. E. MacNary: Industrial studies in manual training, p. 192–202. 20. S. H. Church: Art for the people, p. 203–8. 21. H. T. Bailey: The interrelations of drawing and making, p. 209–16. 22. S. Hamilton: Three types of educational heart-hunger, p. 217–30. 23. A. W. Dow: Design and nature study by mediaeval stone cutters, p. 233–41. 24. L. W. Miller: London congress, p. 242–46. 25. G. W. Gerwig: The segment or the circle, p. 247–56. 26. Herman Schneider: The cooperative idea in industrial education, p. 257–67. 27. J. F. Barker: Vocational training in a modern technical high school, p. 268–74. 28. Bonnie E. Snow: The planning of a course of study in art instruction for public schools, p. 275–78. 29. Daniel Upton: Elementary manual training is necessary in the new industrial education, p. 279–83.

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1433. **International congress for the development of drawing and art teaching.** Report of the American committee, third International congress for the advancement of drawing and art teaching. [Montclair, N. J., The E. Madison co.] 1909. 16 p. 8°.

1434. **Western drawing and manual training association.** *See* 1313, 1314.

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An address by Dr. Charles W. Eliot, delivered at the annual meeting of the Alumni association of the Massachusetts normal art school, Boston, April 16, 1909. Reprinted from the school magazine, the Centre of vision.

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1436. **Association of American law schools.** Proceedings of the ninth annual meeting, held at Detroit, Mich., August 25–26, 1909. [n. p., n. d.] 140 p. 8°. (William R. Vance, secretary-treasurer, George Washington university, Washington, D. C.)

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Contains: 1. H. D. Hazeltine: Legal education in England, p. 50–111. 2. J. H. Wigmore and F. B. Crossley: A statistical comparison of college and high school education as a preparation for legal scholarship, p. 112–36. 3. H. P. Judson: Education preparatory to a university law school course, p. 137–40.

1437. **Terry, Charles T.** Law as an education study. Columbia university quarterly, 12 : 25–31, December 1909.

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Contains: 1. A. D. Bevan, chairman: Address, p. 1–4. 2. N. P. Colwell, secretary: Report, p. 5–15. 3. Reports on medical curriculum, p. 16–24. 4. C. R. Bardeen: Report on anatomy, p. 24–36. 5. E. P. Lyon: Report on organic and physiologic chemistry and physiology, p. 36–46. 6. W. T. Councilman: Report on bacteriology and pathology, p. 46–48. 7. T. Sollmann: Report on pharmacology, toxicology, and therapeutics, p. 48–70. 8. G. Dock: Report on internal medicine, p. 71–81. 9. C. H. Frazier: Report on surgery, p. 81–88. 10. J. B. De Lee: Report on obstetrics and gynecology, p. 88–98. 11. G. E. DeSchweinitz: Report on diseases of the eye, ear, nose, and throat, p. 98–106. 12. W. A. Pusey: Report on dermatology and syphilis, p. 107–8. 13. F. F. Wesbrook: Report on hygiene, medical jurisprudence and medical economics, p. 108–32. 14. G. W. Webster: The medical curriculum and state boards, p. 132–35. 15. Fleming Carrow: Character of state license examination, p. 135–38. Discussion, p. 138–55. 16. R. H. Whitehead: Some results of higher standards of preliminary education, p. 155–59. Discussion, p. 159–65.

1439. ——— ——— Sixth annual conference, held at Chicago, Feb. 28 and March 1 and 2, 1910. Chicago, The Association, 1910. [235]–316 p. 8°. (American medical association bulletin, v. 5, no. 3, January 15, 1910) (N. P. Colwell, secretary of Council, Chicago, Ill.)

Contains: 1. A. D. Bevan, chairman: Address, p. 241–52. 2. N. P Colwell, secretary: Report, p 252–74. 3. Report of special committee on practical tests at state license examinations, p. 274–78. Discussion, p. 278–84. 4. E. E. Brown, United States Commissioner of education: Standards in medical education as related to standards in general education, p. 284–89. 5. H. S. Pritchett: The obligations of the university to medical education, p. 289–99. 6. J. G. Schurman: The relation of the university to the medical school, p. 299–307. 7. V. C. Vaughan: The functions of a university medical school, p. 307–12. Discussion on the addresses of Dr. Brown, President Pritchett, President Schurman and Dr. Vaughan, p. 312–16.

1440. **Association of American medical colleges.** Proceedings of the nineteenth annual meeting, held at New York, N. Y., March 15 and 16, 1909. 108 p. 8°. (Fred C. Zapffe, secretary-treasurer, University of Illinois medical department, Chicago, Ill.)

Contains: 1. E. H. Long, president: Address, Functions of the medical school, p. 3–18. 2. H. S. Pritchett: Standards of medical education, p. 19–21. 3. J. A. Wyeth: A medical student in 1867, p. 22–26. 4. W. H. Carpenter: The combined course, p. 27–36. Discussion, p. 36–40. 5. F. C. Zapffe: The present status of medical education, p. 41–52. 6. John Rogers: The five-year medical course, p. 53–58. Discussion, p. 58–62.

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1441. **Carnegie foundation for the advancement of teaching.** Medical education in the United States and Canada; a report to the Carnegie foundation for the advancement of teaching, by Abraham Flexner, with an introduction by Henry S. Pritchett, president of the Foundation. New York city [c1910] xvii, 346 p. 4°. (*Its* Bulletin, no. 4)

"Mr. Flexner's report is altogether the most valuable contribution to medical education yet made in this country . . . Whether one is searching for details regarding individual schools or is more interested in discussions of the general principles of medical education, he will be repaid by a study of it."—Educational review, October 1910, p. 309.

1442. **Christian, Henry A.** A career in medicine and present-day preparation for it. Science, n. s. 30 : 537–48, October 22, 1909.

Address at the dedication of the department of medicine in Leland Stanford Junior university, September 8, 1909.

1443. **Columbia university.** Proposed plan for an institute of public health and preventive medicine. [New York] 1909. 16 p. 8°.

Report of a committee appointed December 1908, by President Butler.

1444. **Colwell, Nathan Porter.** The need, methods and value of medical college inspection. Chicago, American medical association, 1909. 11 p. 8°.

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1445. **Councilman, William Thomas.** The methods and the object of state examinations. Chicago, American medical association, 1909. 15 p. 8°.

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1446. **Flexner, Abraham.** Medical education in America. Atlantic monthly, 105: 797–804, June 1910.

1447. **Forbes, Edgar Allen.** Too many medical schools. World's work, 20 : 13164–71, July 1910.

1448. **Howell, W. H.** The medical school as part of the university. Science, n. s. 30 : 129–40, July 30, 1909.

Annual address in medicine, Yale university.

1449. **Lewis, Frederic T.** The preparation for the study of medicine. Popular science monthly, 75 : 65–74, July 1909.

1450. **Tobey, Edward Nelson.** The leading school of tropical medicine. Popular science monthly, 76 : 337–43, April 1910.

1451. **Williams, Harold.** The choice of medicine as a profession. Science, n. s. 31 : 601–8, April 22, 1910.

Training of Nurses

1452. **American society of superintendents of training schools for nurses.** Proceedings of the fifteenth annual convention, held at St. Paul, Minnesota, June 7 and 8, 1909; including Report of the second meeting of the American federation of nurses, Minneapolis, Minnesota, June 9, 1909. Baltimore, J. H. Furst company, 1910. 242 p. 8°. (Miss M. Helena McMillan, secretary, Presbyterian hospital, Chicago, Ill.)

Contains: 1. Mrs. I. H. Robb, president: Address, p. 9–13. 2. Report of committee on education, p. 16–20. 3. Report of the committee of the course in hospital economics, p. 21–26. 4. Bertha Erdman: Training school committees, p. 29–31. 5. Martha M. Russell: Training for obstetrical nursing, p. 33–37. 6. Laura A. Beecroft: Ethics to be observed between training schools, p. 53–57. 7. Helen S. Hay: Preparation for institutional work, p. 70–77. 8. Katherine DeWitt: Preparation for private duty, p. 79–80. 9. Emma L. Stowe: Preparation of nurses for private nursing, p. 80–83. 10. Lila Pickhardt: Preparation of the student nurse for private duty, p. 83–85. 11. M. Adelaide Nutting, president: Address, p. 101–9. 12. R. O. Beard: The university education of the nurse, p. 111–25. 13. Lillian D. Wald: A Federal children's bureau, p. 197–204.

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1453. **American society of superintendents of training schools for nurses.** Proceedings of the sixteenth annual convention . . . Baltimore, J. H. Furst company, 1910. 234 p. 4°.

Contains: 1. Julia Stimson: Student government in colleges, p. 117-28. 2. Luella L. Goold: Suggestions as to possibilities of student government in hospital training schools, p. 129-36. 3. Lydia Anderson: Preparation of the teacher for the training school, p. 139-44. 4. F. M. McMurry: The relation of theory to practice, p. 160-68.

1454. **Fenwick, Ethel Gordon.** State registration of trained nurses. Nineteenth century and after, 67 : 1049–60, June 1910.

Music

1455. **Music teachers' national association.** Studies in musical education, history and æsthetics, fourth series. Papers and proceedings of the Music teachers' national association at its thirty-first annual meeting, Northwestern university, Evanston, Ill., December 28–30, 1909. [Hartford, Conn.] The Association, 1910. 252 p. 8°. (F. L. York, secretary, Detroit conservatory, Detroit, Mich.)

Contains: 1. H. D. Sleeper: Practical courses in college studies, p. 118-22. 2. C. G. Hamilton: The basis for academic credit, p. 122-26. 3. Elizabeth B. Bintliff: The emphasis in instruction, p. 126-31. 4. W. F. Bentley: The emphasis in vocal instruction, p. 132-35. 5. E. B. Birge: Music-appreciation in public schools, p. 142-44. 6. L. R. Lewis: The high school curriculum, p. 151-52. 7. Frances E. Clark: The music section of the N. E. A., p. 152-56.

1456. **Case, L. C.** The music situation in the high school. Wisconsin journal of education, 42 : 36–38, 70–72, February, March 1910

1457. **Fleming, Ada M.** Representative high schools of the United States reporting on music in the high school curriculum, May 1909. Educational bi-monthly, 4 : 271–77, April 1910.

1458. **Mason, Daniel Gregory.** The college man and music. Outlook, 94 : 808–10, April 9, 1910.

Theology

1459. **Boyle, Patrick.** The Irish college in Paris (1578–1908). Catholic university bulletin, 15 : 740–53, December 1909.

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1460. **Brann, Henry Athanasius.** History of the American college of the Roman Catholic church of the United States, Rome, Italy. New York [etc.] Benziger brothers, 1910. 570 p. illus. 8°.

1461. **Brown, Francis.** The study of theology in New York city. Columbia university quarterly, 12 : 261–67, June 1910.

1462. **Van der Heyden, Joseph.** The Louvain American college, 1857–1907. Louvain, Printed by F. & R. Ceuterick, 1909. x, [5]–412 p. illus. 8°.

V. EDUCATION OF WOMEN

1463. **Association of collegiate alumnæ.** Proceedings of the annual meeting held in Cincinnati, Ohio, October 27–30, 1909. Association of collegiate alumnæ magazine, series 3, nos. 20–21, February, April 1910, p. 21–61, 1–82. (Mrs. Philip N. Moore, general secretary, 3125 Lafayette avenue, St. Louis, Mo.)

No. 20 contains minutes and reports. No. 21 contains: 1. Elizabeth K. Adams: The psychological gains and losses of college women, p. 11-27. 2. Mrs. J. H. Huddleston: A modified college curriculum, p. 28-43. 3. R. C. Bentley: How shall the American college persist? p. 44-60. 4. Marian Parris: College women in non-teaching professions, p. 61-74. 5. Mrs. W. N. Boyd: College women in the home and in society, p. 75-82.

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1464. **Association of head mistresses.** Report, 1910. [London, Charles North, The Blackheath press, S. E., 1910] 102 p. 8°. (Miss R. Young, secretary, 92 Victoria street, Westminster, S. W., England)

1465. **Southern association of college women.** Sixth report. [San Antonio, Texas, Wood Brownlee printing co.] 1909. 54 p. 12°.

Summary of address of Elmer Ellsworth Brown on Illiteracy and compulsory school attendance laws, at the meeting in Atlanta, April 1909, p. 13.

1466. **Women's educational and industrial union, Boston, Massachusetts.** Thirtieth annual report, October 1, 1907, to October 1, 1908. [n. p. 1909?] 68 p. 8°. (Henrietta I. Goodrich, executive secretary, 264 Boylston street, Boston, Mass.)

1467. ——— Thirty-first annual report, October 1, 1908, to October 1, 1909. [n. p. 1910?] 54 p. 8°.

1468. **Adams, Elizabeth Kemper.** The psychological gains and losses of the college woman. Educational review, 39 : 238–56, March 1910.

Also in Association of collegiate alumnæ magazine, April 1910, p. 11–27.

1469. **Blandin,** *Mrs.* **Isabella Margaret Elizabeth.** History of higher education of women in the South prior to 1860. New York and Washington, The Neale publishing company, 1909. 328 p. 8°.

1470. **Burstall, Sara A.** Modern movements in girls' education. Queen (London) 127 : 694, April 16, 1910.

1471. **Carpenter, Frank G.** College girls of Japan. Moderator-topics, 30 : 91–93, October 7, 1909.

All about the new woman's university and the school for peeresses, founded by the Empress.

1472. **Davies, Emily.** Thoughts on some questions relating to women, 1860–1908. Cambridge, Bowes and Bowes, 1910. 228 p. 12°.

Contains: 1. University degrees and the education of women, 1863, p. 41–62. 2. Secondary instruction as relating to girls, 1864, p. 63–83. 3. Some account of a proposed new college for women, 1868, p. 84–107. 4. On the influence upon girls' schools of external examinations, 1868, p. 108–17. 5. Special systems of education for women, 1868, p. 118–37. 6. Home and the higher education, 1878, p. 138–57. 7. Women in the universities of England and Scotland, 1896, p. 158–200.

1473. **Hayes, Ellen.** Letters to a college girl. Boston, G. H. Ellis co., 1909. 68 p. 12°.

CONTENTS.—Foreword.—College activities.—The elective system.—The study of science.—The study of mathematics.—English and literature.—Undergraduate specializing.—A baccalaureate note.

1474. **Hillis, Annie P.** The serious note in the education of women. Outlook, 94 : 851–55, April 16, 1910.

1475. **Jenkins, Mabel I.** Origin of the Woman's National council of education. Educational foundations, 21 : 579–81, June 1910.

1476. **Marks, Jeannette.** The crowded hours of the college girl. New England magazine, n. s. 42 ; 204–7, April 1910.

1477. **Marlborough, Consuelo,** *duchess of.* Higher education for women. Outlook, 95 : 792–93, August 6, 1910.

Also in American educational review, 31 : 747–48, September 1910.

1478. **Mirguet, V.** L'éducation de la jeune fille contemporaine spécialement de la jeune fille du monde. Bruxelles, Em. Rossel, imprimeur-éditeur, 1910. 298 p. 12°.

1479. **Repplier, Agnes.** The girl graduate. Century magazine, 80 : 227–30, June 1910.

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1480. **Talbot, Marion.** The college, the girl and the parent. North American review, 192 : 349–58, September 1910.

1481. ——— The education of women. Chicago, University of Chicago press, 1910. 255 p. 12°.

"Dean Talbot's little book is a real contribution to the rapidly growing literature on higher education. While dealing avowedly with the education of women, it asserts as a cardinal principle for all discussion that education is fundamentally a social problem which must be studied and dealt with in its relations to economic and social conditions and development."—School review, November 1910, p. 645.

1482. **Walsh, Trevor.** Some recent developments in the education of girls. Parents' review, 21 : 280–91, April 1910.

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1483. **Armstrong, James E.** The advantages of limited sex segregation in the high school. [Chicago? 1901] p. 339–350. 8°.

Reprinted from the School review, vol. XVIII, no. 5, May 1910.

Read before the Central association of science and mathematics teachers at the University of Chicago, November 1909.

1484. **Grant, Cecil.** English public school morality and coeducation. Parents' review, 837–45, November 1909.

1485. **Hinsdale, Ellen C.** Coeducation again. School review, 18 : 36–39, January 1910.

1486. **Olin, Helen R.** The women of a state university; an illustration of the working of coeducation, in the Middle West. New York and London, G. P. Putnam's sons, 1909. 308 p. 12°.

The coeducational experience of the University of Wisconsin presented as an aid for the solution of present problems in woman's education.

1487. **Zauck, Carl.** Warum und wieweit bedingt der geschlechtsunterschied der schüler eine differenzierung der lehr- und stoffpläne für knaben- und mädchenvolksschulen? Minden i. W., A. Hufeland, 1910. 24 p. 8°. (Lehrerprüfungs- und informations-arbeiten. hft. 44)

VI. SPECIAL CLASSES OF PERSONS

INDIANS

1488. **Lake Mohonk conference of friends of the Indian and other dependent peoples.** Report of the twenty-seventh annual meeting, October 20th, 21st, and 22d, 1909. 214 p. 8°. (C. F. Meserve, secretary, Raleigh, N. C.)

Contains: 1. E. E. Brown: The white man's burden in Alaska, p. 12-16. 2. H. B. Peairs: Results of the work of Haskell institute, p. 53-55. 3. W. W. Pettit: The mission of the public school in the Philippines, p. 100-4. 4. Edmund Enright: The Filipino students in the United States, p. 132-38. 5. W. F. Willoughby: The problem of political education in Porto Rico, p. 160-69.

1489. **Leupp, Francis E.** The Indian and his problem. New York, C. Scribner's sons, 1910. 369 p. 8°.

NEGROES

1490. **Dillard, James H.** The Jeanes fund. Independent, 67 : 1250–52, December 2, 1909.

1491. ——— Negro rural schools. Southern educational review, 6 : 303–8, February, March 1909.

1492. **Douglass, H. Paul.** Problems and programs of negro education. *In his* Christian reconstruction in the South. Boston, The Pilgrim press [1909] p. 265–302.

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1493. **Hampton, Virginia. Normal and agricultural institute.** Every-day life at the Hampton normal and agricultural institute. Hampton, Virginia, The Press of the Hampton normal and agricultural institute, 1909. 32 p. illus. 8°.

1494. **Ovington, May White.** Closing the little black schoolhouse; second National negro conference results in new organization. Survey, 24 : 343–45, May 28, 1910.

1495. **Washington, Booker T.** A university education for negroes. Independent, 68 : 613–18, March 24, 1910.

ORIENTALS

1496. **Foster, John W.** What young China can learn from America. Chinese students' monthly, 6 : 24–30, November 1910.

See also in same periodical, p. 16–19, article on the Boxer indemnity students of 1910.

IMMIGRANTS AND CHILDREN OF IMMIGRANTS

1497. **Fairman, Charles G.** College-trained immigrants; a study of Americans in the making. New England magazine, n. s. 42 : 577–84, July 1910.

An illustrated account of the American international college at Springfield, Mass.

1498. **Moore, Sarah Wool.** The teaching of foreigners. Survey, 24 : 386–92, June 4, 1910.

1499. **O'Brien, Sara R.** Teaching English to foreigners. School work, 8 : 430–37, February 1910.

THE DESTITUTE (ORPHANS, OUTCASTS, PAUPERS, ETC.)

1500. **Reeder, Rudolph R.** How two hundred children live and learn. New York, Charities publication committee, 1910. 247 p. 12°.

An account of the New York orphan asylum, Hastings-on-Hudson, by its superintendent.

"There are chapters on Dietary, Work, Play, School life, Punishments, Economic and moral training, Religious instruction and so on . . . These chapters are not mere dry, theoretical discussions of the principles involved, but rather a concrete presentation of the actual life interests of two hundred very real children . . . The book is unique and the first of its kind."—Survey February 12, 1910, p. 734.

THE BLIND

1501. **Allen, Edward E.** Impressions of institutions for the blind in Germany and Austria. Outlook for the blind, 3 : 139–48, Winter 1909; 4 : 7–16, Spring 1910.

1502. **Bishop, S. H.** Basis of work for the blind; work of Overbrook. Century, 78 : 82–94, May 1910.

1503. **Campbell, Charles F. F.** Inventory of work for the blind in America. Outlook for the blind, 3 : 119–34, 156–72; 4 : 17–27, Autumn, Winter 1909, Spring 1910.

The "inventory" includes schools, shops, libraries, nurseries, commissions, etc.

1504. **Czily, A.** Conversing with the blind-deaf. Volta review, 12 : 77–85, May 1910.

A description of the various methods employed for communicating with persons who are both blind and deaf.

1505. **Desagher, Maurice.** L'enseignement des aveugles . . . Bruxelles, M. Weissenbruch, imprimeur du roi, 1909. 28 p. 8°.

Extrait de la Revue de Belgique.

1506. **Howe, Samuel Gridley.** Letters and journals, ed. by his daughter, Laura E. Richards. vol. 2. Boston, D. Estes & company, [1909] 8°.

The story of the great work for the blind accomplished by this "servant of humanity," told in his own words.

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1507. Which tactile print for New York city, New York point or braille? Outlook for the blind, 3 : 64–88, Summer 1909.

A hearing before the Board of education in which the much disputed question of the best system of embossed type for the blind was discussed at length by various authorities.

THE DEAF

1508. **American association to promote the teaching of speech to the deaf.** Report of the proceedings of the eighth summer meeting held at Chicago from June 28th to July 5th, 1909. Association review, 11 : 263–470, October 1909.

1509. **American laryngological, rhinological and otological society.** Symposium on the deaf child from the viewpoint of physician and teacher. Volta review, 12 : 267–318, August 1910.

Papers by Dr. G. Hudson Makuen, Dr. F. R. Packard, Dr. M. A. Goldstein, Dr. A. L. E. Crouter, J. W. Jones, and Mary McCowen, with discussion by Dr. A. Graham Bell and others. To this symposium also belong papers by Dr. J. Kerr Love and Mrs. J. S. Anderson in Volta review, 12 : 143–54, June 1910, and Dr. E. M. Gallaudet in American annals of the deaf, 55 : 342–49, September 1910.

1510. **Bund deutscher taubstummenlehrer.** Bericht über die VIII. versammlung . . . zu Leipzig 3.–6. October 1909. Leipzig, Selbstverlag des Bundes deutscher taubstummenlehrer, 1909. 228 p. 8°

The principal subject of discussion was the instruction of such deaf children as cannot successfully be taught by the oral method. The following resolution was unanimously adopted by the convention of 286 persons, composed of teachers of the deaf and representatives of the German government: "The convention agrees with the author of the paper (Mr. Kische) that there are deaf mutes, although in a limited number, who are not able through the oral method to acquire language sufficiently for the necessities of life. It is desirable that attempts should be made to give these children in some other way the requisite facility for communicating with hearing persons."

1511. **Barton, J. D.** The relation of manual to intellectual training. Teacher of the deaf, 8 : 17–22 and 50–53, January, March 1910.

1512. **Binet, Alfred** *and* **Simon, Th.** Une enquête sur la méthode orale. Année psychologique, 15 : 373–96, 1909 [Translated in American annals of the deaf, 55 : 4–33, January 1910]

The conclusions of these distinguished French psychologists are decidedly unfavorable to the oral method of teaching the deaf. A rejoinder by E. Drouet is published in American annals of the deaf, 55 : 307–25, September 1910.

1513. **Ferreri, Giulio.** Documenti per la storia dell' educazione dei sordomuti raccolti e ordinati. Milano, G. Sulli Rao, 1909. 85 p. 8°. (Biblioteca del periodico "L'educazione dei sordomuti," vol. IV)

The principal document in this volume is a letter written by the Jesuit Abbate Giovanni Andres in 1793, exalting Pedro Ponce above all other teachers of the deaf and protesting against the praises bestowed by his contemporaries upon De l'Epée.

1514. ——— Questioni varie intorno all' istruzione dei sordomuti (1889–1909). Torino, G. B. Paravia e *c.*, 1910. vii, 261 p. 16°

1515. **Long, J. Schuyler.** The sign language. A manual of signs. Being a descriptive vocabulary of signs used by the deaf in the United States and Canada. Washington, D. C., Press of Gibson Bros., [190–?] 164 p. 8°.

The first successful attempt ever made to give in words an accurate description of the signs of the sign language used by the deaf.

1516. **Love, James Kerr.** Cerebral physiology and the education of deaf children. American annals of the deaf, 54 : 293–327, September 1909.

An exposition of the most recent views concerning the localization in the brain of speech, language, sight, and hearing centers, and the bearing of these views upon the education of the deaf.

1517. ——— Deafness in the school child. Teacher of the deaf, 7 : 184–89, November 1909.

Dr. Love maintains that semi-deaf and semi-mute children should reside in their own homes and attend day-schools. He also urges the timely removal of post-nasal adenoids, as likely to lead to improvement in hearing.

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1518. **McIlvaine, J. A.,** *jr.* A plea for the feeble-minded deaf. American annals of the deaf, 54 : 444–50, November 1910.

The author shows the importance of making special provisions for this class in schools separate from those for the intelligent deaf and those for the feeble-minded hearing.

1519. **Reuschert, E.** Die gebärdensprache der taubstummen und die ausdrucksbewegungen der vollsinnigen. Leipzig, H. Dude, 1909. 222 p. 8°.

An elaborate treatise on the sign language and its place in the oral instruction of the deaf and in the life of the deaf mute out of school.

1520. **Schumann, Georg** *and* **Schumann, Paul.** Neue beiträge zur kenntniss Samuel Heinickes. Leipzig, E. Wiegandt, 1909. 148 p. 8°.

A sketch of the founder of the instruction of the deaf in Germany, with a bibliography of his manuscripts, letters, and publications.

1521. **Story, A. J.** Voice training for the deaf. Teacher of the deaf, 7 : 190–97, November 1909.

Reports of experiments made in Italy, France, and England to improve the speech of deaf children.

1522. **Thollon, B.** *and others.* Bulletin international de l'enseignement des sourds-muets. Première année. Grenoble, Alber frères, 1909. 53 p. 8°.

Contains a long and valuable symposium in French on lip-reading, with a summary of the opinions expressed in English, German and Italian; also a bibliography.

1523. **Wright, John D.** The speech method of educating the deaf. American educational review, 31 : 219–21, 281–87, 415–21, January, February, April 1910.

CRIPPLED CHILDREN

1524. **McMurtrie, Douglas C.** Jimmy's fight for independence. New York city, 1910. [16 p.] 8°.

Describes the practical work done by the Association for the aid of crippled children, in New York city.

BACKWARD CHILDREN

[*See also* Retardation of pupils]

1525. **National association for the study and education of exceptional children.** Proceedings of the exercises and conferences, inaugurated upon the occasion of the tenth anniversary of the Groszmann school for nervous and atypical children, April 1, 1910. [Plainfield, N. J., National association for the study and education of exceptional children, 1910] vii, 141 p. 8°. (Waldemar H. Groszmann, secretary, Watchung Crest, Plainfield, N. J.)

Contains: 1 F. J. A. Torek: The history and aims of the National association for the study and education of exceptional children, p. 13–17. 2. A. W. Edson: What is being done in the public schools of New York city in the training of exceptional children, p. 18–23. 3. M. L. Bonham, jr.: The problem of defective pupils in the regular schools, public and private, p. 24–30. 4. M. Neustaedter: Why should the exceptional child receive training suited to its needs at public expense? p. 31–34. 5. Arthur Zentler: Oral defects a great hindrance in the proper development of children; the State's duty to cope with these conditions, p. 35–40. 6. H. H. Horne: Remarks on the education of exceptional children, p. 41–43. 7. E. B. McCready: Biological variations in the higher cerebral centers causing retardation, p. 45–53. 8. J. H. Claiborne: Types of congenital amblyopia (word blindness), p. 54–60. 9. C. W. Crampton: The differences between anatomic, physiological, psychological, and chronological age as causes of derailment, p. 70–75. 10. E. L. Hunt: Hereditary and congenital causes of exceptional development, p. 76–85. 11. S. P. Goodhart: The influence of education and environment upon the early development of the exceptional child, p. 86–97. 12. S. V. Haas: The value of prophylaxis in the early life of the exceptional child, p. 98–102. 13. M. P. E. Groszmann: The exceptionally bright child, p. 103–12. 14. W. S. Monroe: The training of teachers for backward and feeble-minded children, p. 114–16. 15. Maurice Fishburg: Ethnic factors in education, p. 117–22. 16. E. K. Coulter: The exceptional child and the law, p. 124–29. 17. M. P. E. Groszmann: Tentative classification of exceptional children, p. 132–34.

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1526. **National conference on the education of backward, truant and delinquent children.** Proceedings of the sixth annual session, held in Buffalo, N. Y., June 7th and 8th, 1909. Glen Mills, Pa., The Glen Mills school of printing, 1909. 181 p. 8°. (E. L. Coffeen, secretary, Westboro, Mass.)

Contains: 1. *Mrs.* Ophelia L. Amigh: What can be done with the border-line girl, who is somewhat defective but not feeble-minded? p. 3–7. Discussion, p. 7–16. 2. W. F. Penn: Problems in discipline, p. 16–22. Discussion, p. 22–25. 3. E. L. Coffeen: Cooperation of public school authorities with institutional authorities, p. 25–29. Discussion, p. 29–33. 4. *Mrs.* Anna L. Morrissa. The child problem in the smaller towns and rural districts, p. 34–39. Discussion, p. 39–40. 5. J. A. Burnett: How can the cottage life of the delinquent boy and girl be made more home-like, p. 40–48. Discussion, p. 48–54. 6. *Miss* Florence A. McNeal: Ungraded schools for backward children as a means for reclaiming delinquent children, p. 54–67. 7. *Mrs.* J. Ellen Foster: Remarks, p. 68–76. 8. B. Flexner. Juvenile courts from the point of view of the lawyer, p. 77–93. Discussion, p. 93–98. 9. C. W. Skinner: The effect of play in the development of a child, p. 99–106. Discussion, p. 106–12. 10. *Miss* Marian Campbell: How the settlement workers may cooperate with the juvenile courts, p. 112–17. Discussion, p. 117. 11. H. H. Hart: Home-placing, p. 118–26. Discussion, p. 126–31. 12. Report of the special committee on a system of uniform statistics for institutions dealing with defective and delinquent children, p. 135–38. 13. B. D. Bogen: Correctional work among Jewish boys and girls, p. 139–49. Discussion, p. 149–52. 14. *Miss* Grace Johnson: How can the visiting agents of an institution influence the parents and relatives of the children so that the homes to which they will afterwards be returned shall be greatly improved or reformed? p. 153–62. 15. G. B. Robinson: What the New York Catholic protectory is doing for its boys and girls, p. 168–74. 16. F. H. Nibecker: Former conventions and results thereof, p. 174–80.

1527. **Anderson, W. T.** What are we doing for the backward pupil? Wisconsin journal of education, 41: 272–74, October 1909.

1528. **Downing, Bertha C.** Defective speech in backward and feeble-minded children. New York, 1909. 14 p. 12°.

Reprinted from the Medical record, October 30, 1909.

1529. **Greene, Mary B.** A class of backward and defective children. Psychological clinic, 3: 125–33, October 15, 1909.

This class has been supported by one of Philadelphia's citizens widely known for his interest in all educational matters.

1530. **Groszmann, Maximilian Paul Eugen.** Classification of exceptional children as a guide in determining segregation. [Easton, Pa., 1909] 12 p. 8°.

1531. **Jones, Olive M.** The systematic care of the exceptional child. School work, 8: 406–10, February 1910.

1532. **Kirby, Lydia A.** What is being done for backward and mentally deficient children in the public schools of Philadelphia. American education, 13: 212–13, January 1910.

1533. **Maennel, B.** Auxiliary education, the training of backward children; translated by Emma Sylvester. New York, Doubleday, Page & company, 1909. 267 p. 8°.

A new translation of this standard work, with Bibliography, p. 245–67.

1534. **Maguire, Margaret I.** A classification of backward and differentiated children based on the cause of failure. Journal of education, 71: 315–16, 346–47, March 24, March 31, 1910.

MENTALLY DEFECTIVE CHILDREN

1535. **Bösbauer, Hans, Miklas, Leopold** *and* **Schiner, Hans,** *ed.* Handbuch der schwachsinnigenfürsorge mit berücksichtigung des hilfsschulwesens. 2d ed. Wien, Karl Graeser & kie.; Leipzig, B. G. Teubner, 1909. viii, 363 p. 8°.

"Bibliographie," p. 304–354.

1536. **Farrell, Elizabeth E.** Education of mentally defective children. *In* New York (City) Board of education. Eleventh annual report of the superintendent of schools to the Board of education, 1909. New York [1909] p. 634–645.

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1537. **Plass, Louis.** Praktische erziehungsarbeit im fürsorgeheim "Am urban." Berlin, Henmann, 1910. 27 p. 8°.

1538. **Tredgold, A. F.** The feeble-minded. Contemporary review, 97: 717–27, June 1910.

MORALLY DEFECTIVE—TRUANTS, ETC.

1539. **Hart, Hastings H.** A study for delinquent boys. Survey, 23: 146–50, October 30, 1909.

Report of the New York state training school commission.

1540. **Maennel, B.** Das amerikanische jugendgericht und sein einfluss auf unsere jugendrettung und jugenderziehung. Langensalza, H. Beyer und söhne, 1909. 34 p. 8°. (Beiträge zur kinderforschung und heilerziehung. Heft 59)

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1541. **Münch, Wilhelm.** Gedanken über fürstenerziehung aus alter und neuer zeit. München, Oskar Beck, 1909. viii, 325 p. 8°.

VII. EDUCATION EXTENSION

CONTINUATION SCHOOLS

1542. **Great Britain. Board of education.** Compulsory continuation schools in Germany. London, Printed for H. M. Stationery office, by Eyre & Spottiswoode, 1910. 75 p. 8°. (Educational pamphlets, no. 18)

1543. ——— ——— **Consultative committee.** Report of the Consultative committee on attendance, compulsory or otherwise, at continuation schools. Presented to Parliament by command of His Majesty. London, Printed for H. M. Stationery office, by Eyre and Spottiswoode, ltd., 1909. 2 v. 8° ([Parliament. Papers by command] Cd. 4757–4758)

CONTENTS.—1. Report and appendices. (Adopted by the committee, May 7th, 1909)—2. Summaries of evidence.

Reviewed in Educational times, 62: 305–6, August 1909.

1544. **Lembke, Fr.** Der ländliche fortbildungs-schulunterricht, präparationen und aufgaben. Im anschluss an den "Lehrplan für ländliche fortbildungsschulen in Preussen" . . . Leipzig, Quelle & Meyer, 1909. 105 p. 8°

1545. **Ray, Julien.** L'instruction et l'éducation après l'école et plus spécialement à la caserne. Lyon, A. Rey & cie., 1909. 62 p. 8°

EVENING SCHOOLS

1546. **Great Britain. Board of education.** The course system in evening schools. London, Printed for H. M. Stationery office, by Eyre & Spottiswoode, 1910. 75 p. 8° (Educational pamphlets, no. 19)

1547. **Weimer, Solomon.** Evening high schools and their possibilities. Ohio educational monthly, 58 : 481–85, September 1909.

SUMMER SCHOOLS

1548. **Carney, Frank.** Summer schools. Nation, 89 : 509–10, November 25, 1909.

1549. **MacDonald, William.** The status of the summer school. Nation, 89 : 202–3, September 2, 1909.

UNIVERSITY EXTENSION

1550. **Duggan, Stephen Pierce.** The night college of the city of New York. Independent, 68 : 860–65, April 21, 1910.

1551. **Gilbey, Walter.** The educative value of the modern museum. Nineteenth century and after, 66 : 663–72, October 1909.

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1552. **Reber, Louis E.** University extension. Science, n. s. 32 : 97–104, July 22, 1910.

1553. **Ropes, J. H.** The possibilities of university extension in Boston. Harvard graduates' magazine, 18 : 608–14, June 1910.

1554. **Shields, Thomas Edward.** University extension. Catholic university bulletin, 16 : 591–603, June 1910.

LIBRARIES IN EDUCATION

1555. **Arnold, Gertrude Weld.** A mother's list of books for children. Chicago, A. C. McClurg & co., 1909. 270 p. 16°

"A valuable collection of titles of books of real worth, with names of publishers, prices, etc. It will help parents to select the right volumes for children of different ages."—Education, February 1910, p. 399.

1556. **Ashmun, Margaret.** Library reading in the high school. I, II, III, IV. School review, 17 : 618–22, 701–4, 18 : 196–99, 270–73, November, December 1909, March, April 1910.

1557. **Bailey, R. D.** Choice list of children's books. Moderator-topics, 30 : 408–10, January 27, 1910.

1558. **Bascom, John.** The college library. Educational review, 38 : 139–49, September 1909.

1559. **Bostwick, Arthur E.** The American public library. New York and London, D. Appleton and company, 1910. 394 p. illus. 12°

1560. **Brown, Elmer Ellsworth.** The use of reference books. *In* Appleton's new practical cyclopedia. New York, D. Appleton and company, 1910. Volume 1, p. v–xi.

1561. Children's catalog; a guide to the best reading for young people based on twenty-four selected library lists; comp. by Marion E. Potter, assisted by Bertha Tannehill and Emma L. Teich. Minneapolis, The H. W. Wilson company, 1909. 2 pt. in 1 v. 4°

CONTENTS.—Pt. 1. Author, title and subject catalog of 3,000 books.—Pt. 2. Author and subject index to St. Nicholas, volumes 28 to 36, and analytical subject references to over five hundred books cataloged in part 1.

"The catalogue stands fairly well the test of catholicity, popularity, and democratic averages of taste."—Nation, February 10, 1910, p. 144.

1562. **Cleveland, Ohio. Public library.** The work of the Cleveland public library with the children and the means used to reach them, published for the information of the citizens of Cleveland. Second ed. Cleveland, June 1910. 51 p. 8°

A brief statement of work in the children's room of the library and its branches, also of work with reading clubs and libraries established in schools and homes.

1563. **Hopkins, Florence May.** The place of the library in high school education. Library journal, 35 : 55–60, February 1910.

"Substance of a paper read before the Michigan state teachers' association, at Saginaw, October 29, 1909."

1564. **Johnston, William Dawson.** The librarian as an educator. Library journal, 35 : 437–41, October 1910.

Read before the New York state library association, Lake George, September 19, 1910.

1565. ——— The library as a reinforcement of the school. American education, 13 : 208–11, January 1910.

Reprinted from New York (State) University. Proceedings of 47th annual convocation, 1909. p. 27–32.

1566. **Legler, Henry G.** The Chicago public library and co-operation with the schools. Educational bi-monthly, 4 : 309–20, April 1910.

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1567. **Macy, John Albert.** A guide to reading, for young and old. New York, The Baker & Taylor company, 1910. 273 p. illus. 12°

1568. **Matthews, Brander.** Books and boys. Independent, 67 : 1117–19, November 18, 1909.

1569. The model school library. Western journal of education, 15 : 148–58, 195–203, March, April 1910.

"The model school library was prepared by a joint committee of the California teachers' association and of the California library association. . . . The idea has been to make this an 'all around library' for a country school having all the grades. . . . The model library is at present in the California state library."

1570. **Struthers, John.** The reading of public school children. Religious education, 4 : 468–78, December 1909.

This account of the plans of the National home reading union of Great Britain was prepared for circulation amongst the inspectors of the schools of Scotland. It calls attention to a matter of grave import everywhere and suggests a valuable aid in moral training.

1571. **Vaile, Harry S.** The public library as a factor in public education. Educational bi-monthly, 4 : 149–53, December 1909.

1572. **Wilson, Louis N.** The library and the teaching profession. Public libraries, 15 : 93–98, March 1910.

UNIVERSITIES, COLLEGES, ETC.

UNITED STATES

University of Arkansas

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AUTHOR AND SUBJECT INDEX.

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Abbey, M. J., 1399.
Abbot, J. W., 516.
Abbot, W. F., 681.
Abbott, A. H., 645.
Abbott, Lyman, 381, 801.
Abercrombie, D. W., 1151.
Abercrombie, J. W., 107 (4), 107 (29).
Abt, I. A., 517.
ACADEMIC DEGREES, 905.
Adams, C. F., 776.
Adams, Elizabeth K., 1468.
Adams, John, 429.
Addams, Jane, 1201.
ADMINISTRATION, 107 (64), 107 (136-138), 937-1021; college and university, 846-854.
ADOLESCENCE. *See* CHILD STUDY.
Affleck, G. B., 43, 1112 (24).
Agahd, Konrad, 1202.
AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS. *See* AGRICULTURAL EDUCATION, colleges.
AGRICULTURAL EDUCATION, 95 (5), 96 (24-25), 96 (27-28), 107 (160-167), 116 (10), 119 (16), 143 (14), 830 (3), 1396-1413; colleges, 830 (4), 1397 (2), 1397 (6-7), 1397 (9-12), 1400, 1411, 1413; elementary schools, 96 (20), 127 (2), 135 (3), 637-641, 1106; high schools, 96 (5), 96 (21), 116 (53), 119 (38), 144 (19-21), 148 (1), 749-758, 1397 (10); normal schools, 78 (6), 96 (22-23).
Aguayo, A. M., 786.
Alabama educational association, 119.
ALASKA, 1488 (1).
Alden, R. M., 802.
Aldrich, J. M., 827.
Aldrich, Louise, 274.
Alexander, M. W., 1340.
Aley, R. J., 107 (20), 132 (1).
Allbee, B. H., 937.
Allen, E. E., 1501.
Allen, J. E., 116 (28).
Allen, J. W., 689.
Allen, W. O., 787.
Allison, Andrew, 603.
Allport, Frank, 107 (33)
Alston, Leonard, 330.
Amante, Bruto, 935.
American association for the advancement of science, 73.
American association of farmers' institute workers, 1396.
American association to promote the teaching of speech to the deaf, 1508.
American federation of arts, 1430-1431.
American federation of labor, 1341.
American foundrymen's association, 1342.
American historical association. Committee of eight, 589; Committee of five, 693.
American historical association. Conference on history in secondary schools, 687.
American home economics association, 1414.
American institute of instruction, 78.
American laryngological, rhinological and otological society, 1509.
American medical association. Council on medical education, 1438-1439.
American nature-study society, 602.
American philological association. Commission on college entrance requirements in Latin, 870.
American psychological association. Committee on the teaching of psychology, 885.
American school hygiene association, 1045.
American school peace league, 1279.
American society of superintendents of training schools for nurses, 1452-1453
Ames, C. H., 360.
Amigh, Ophelia, 1526 (1).
Amoroso, Pietro, 539.
ANCIENT EDUCATION, 192-194.
Anderson, Leroy, 749.
Anderson, W. T., 1527.
Andres, Giovanni, 1513.
Andrews, C. M., 30.
Angell, E. D., 998.
Angell, J. B., 900 (1).
Ankeney, J. S., 1313 (2).
Appleton, Lilla E., 45, 513.
APPRENTICESHIP, 1339 (9). *See also* INDUSTRIAL EDUCATION, co-operative system.
ARBITRATION, INTERNATIONAL, 1279-1285.
ARBOR DAY, 1149-1150.
ARCHEOLOGY, 1431 (3).
Archer, R. L., 25, 594.
ARCHITECTURAL EDUCATION, 1426.
ARCHITECTURE. *See* COLLEGE ARCHITECTURE; SCHOOL ARCHITECTURE AND EQUIPMENT.
Argentine Republic. Consejo nacional de educacion, 265.
ARISTOTLE, 351.
ARITHMETIC, 78 (10), 617-620.
ARKANSAS, education, 96 (14).
Arkansas state teachers' association, 120.
ARKANSAS. UNIVERSITY, 1573.
Arles, Henri d', 1575.
Armstrong, H. E., 382.
Armstrong, J. E., 1483.
Arnold, Felix, 469, 992.
Arnold, Gertrude W., 1555.
Arnold, Sarah L., 1343.
Arnstein, Leo, 1201.

Digitized by Google

ART, 107 (102-107), 622-626, 1187 (5), 1313-1314, 1431 (2), 1432 (4), 1432 (8). *See also* FINE ARTS.
Ashley, M. L., 430.
Ashmore, S. G., 1375.
Ashmun, Margaret, 1556.
ASIA, history of education, 325.
Association of American agricultural colleges and experiment stations, 1397.
Association of American law schools, 1436.
Association of American medical colleges, 1440.
Association of American universities, 793.
Association of colleges and preparatory schools of the middle states and Maryland, 794.
Association of colleges and preparatory schools of the Southern States, 795-796.
Association of collegiate alumnae, 1463.
Association of cosmopolitan clubs, 900-901.
Association of head mistresses, 1464.
Association of history teachers of the middle states and Maryland, 688.
ASSOCIATIONS, SOCIETIES, AND CONFERENCES, foreign, 171-176, 514-515. 674; national 73-118; state, 119-170.
ATHLETICS, 149 (44); college, 796 (3), 800 (3), 805, 1142-1147; high school, 1138.
ATTENDANCE, SCHOOL, 107 (24-25), 116 (14), 1019.
Atwood, W. T., 1584.
ATYPICAL CHILDREN. *See* BACKWARD CHILDREN.
Austen, W. H., 1.
AUSTRALIA, secondary education, 346.
Avent, J. E., 938.
Aydelotte, Frank, 843.
Aylesworth, B. O., 383.
Ayres, L. P., 42, 159c (2), 159c (5), 1045 (12), 1067, 1091.

Babcock, E. B., 750, 1098.
Bachman, F. P., 571, 624, 939, 982.
BACKWARD CHILDREN, 107 (46-47), 107 (49-52), 116 (18), 116 (51), 149 (8-10), 159c (9-10), 1045 (12), 1068, 1113, 1525-1534. *See also* MENTALLY DEFECTIVE CHILDREN; RETARDATION OF PUPILS.
Bacon, L. A., 1314 (4).
Baden-Powell, R. S. S., 4, 694.
Bäumer, Gertrud, 504.
Bagley, W. C., 384.
Bailey, H. T., 23, 96 (16), 1314 (1), 1315, 1376, 1432 (2).
Bailey, L. H., 550, 604, 1397 (2), 1460.
Bailey, R. D., 1557.
Baker, J. H., 107 (55), 797 (2).
Baker, May L., 266.
Baker, N. R., 1038.
Baker, R. S., 1181.
Baker, T. S., 1170.
Baldwin, W. A., 646.
Ballinger, R. A., 1591.
BALTIMORE, education, 1012.
Bancroft, Jessie H., 999, 1126.
Bard, H. E., 940.
Bardeen, C. R., 1438 (4).
Bardeen, C. W., 773, 915.
Barker, E. L. 803, 1401.
Barker, J. F., 799 (2), 1432 (27).
BARNARD, F. A. P., 352.
BARNARD COLLEGE, 1574.
Barnes, C. W., 107 (12).
Barnes, Harold, 431.
Barney, E. S., 1344.
Barrett, C. S., 96 (24).
Barrows, Alice P., 1425.
Barry, W. F., 1047.
Barton, J. D., 1511.
Bascom, John, 1558.
Bascone, Francesco, 970.
Basedow, J. B., 385.
Baskette, G. H., 116 (61).
Baskin, Marion L., 116 (58).
Batchelder, E. A., 1313 (11).
Bates, Frank, 629.
Bates, H. E., 78 (3).
Bayliss, Clara K., 182.
Beale, Dorothea, 432.
BEALE, DOROTHEA, 353.
Beard, A. F., 375.
Beard, C. A., 688 (2), 886.
Beard, R. O., 1452 (12).
Beardsley, L. W., 978.
Beatty, J. W., 1432 (10).
Beecroft, Laura A., 1452 (6).
Beers, H. A., 1593.
Beier, Adolf, 933.
BELGIUM, domestic science, 1417.
Bell, R. M., 828.
Bennett, A. E., 1048.
Bennett, C. A., 1314 (20), 1316.
Benson, A. C., 1287.
Benson, O. H., 551.
Bentley, R. C., 1463 (3).
Bentley, W. F., 1455 (4).
Bently, W. B., 800 (9).
Benton, G. P., 250.
Berg, Arthur, 386.
Berger, S. E., 688 (8).
BERKELEY HIGH SCHOOL, 1390.
Bernard, L. L., 887.
Berry, T. W., 1317.
Best, L. A., 971.
Bestetti, Gius, 666.
Betts, G. H., 470.
BEVERLY, MASS., industrial education, 1339 (10).
Bhabha, H. J., 1318.
BIBLE, teaching. *See* SUNDAY SCHOOLS.
BIBLIOGRAPHY, 1-60.
Biétry, Pierre, 932.
Bigelow, M. A., 1398 (1).
Binet, Alfred, 492, 1512.
Binns, C. L., 36, 1319.
Bintliff, Elizabeth B., 1455 (3).
BIOGRAPHY, general, 347-350; special, 351-380.
BIOLOGY, 736-738, 1398 (6).
Birdseye, C. F., 73 (9), 200, 794 (1-2), 804, 846-848, 1152.
Birge, E. B., 1455 (5).
Bishop, E. C., 605.
Bishop, S. H., 1502.
Blackwell, R. E., 96 (10).
Blair, F. G., 130 (1), 131 (2).
BLAKE, WILLIAM, 354.
Blan, L. B., 1006.
Blandford, F. G., 1231.
Blandin, Isabella M. E., 1469.
Blayney, T. L., 1431 (2).
Blewett, Ben, 107 (11), 107 (51).
Bleyer, W. G., 668.
BLIND, 107 (48), 1045 (7), 1501-1507.
Blow, Susan E., 361.

Digitized by Google

BOARDING SCHOOLS. *See* PRIVATE-SCHOOL EDUCATION.
Bobbitt, J. F., 493.
Bock, Alfons, 184.
Bösbauer, Hans, 38, 1535.
Bogen, B. D., 1526 (13).
Bohnenkamp, H., 433.
BOLCE, HAROLD, 818.
BOLOGNA. UNIVERSITY, 1626.
Bolton, F. E., 387.
Bond, G. G., 116 (49).
Bonferroni, Luigi, 630.
Bonham, M. L., *jr.*, 1525 (3).
BOOKBINDING, 1314 (6).
Bookwalter, C. A., 1363 (5).
Boone, C. L., 1320-1321.
BOSTON, university extension, 1553.
Boston home and school association, 1186.
Boston. Superintendent of public schools, 1293.
Bostwick, A. E., 1559.
BOTANY, 735.
Bovey, H. T., 1187 (15).
Bowden-Smith, A. Georgette, 201.
Bowdish, B. S., 606.
Bowen, W. P., 1134.
Bowers, Sarah E., 1312 (7).
Boyd, *Mrs.* W. N., 1463 (5).
Boyden, A. C., 78 (9).
Boyle, Patrick, 1459.
Boynton, C. E., 116 (18).
BOYS' CLUBS, 1021.
Bradford, John, 1112 (25).
Bradley, *Miss* G. M., 1187 (11).
Brann, H. A., 1460.
Branner, J. C., 96 (18).
Brannon, M. A., 1402.
Branson, E. C., 275.
Bray, F. C., 1280 (7).
Brémond, F., 434.
Brewer, C. J., 924.
Brewer, Dustan, 505.
Brewster, W. T., 1574.
Bricout, J., 288.
British association for the advancement of science 172.
Brittain, M. L., 116 (1).
Brookman, Thirmuthis, 702.
Brooks, C. J., 435.
Brooks, E. C., 567, 796 (4).
Brooks, S. D., 107 (19), 107 (52), 1293, 1345.
Brooks, Sarah C., 615, 688 (4).
Brouse, J. P. W., 116 (33).
Brown, C. F., 688 (6).
Brown, E. E., 95 (6), 107 (36), 107 (40), 107 (58), 107 (66), 107 (112), 362-363, 388, 794 (3), 797 (5), 859, 965-967, 1212, 1430, 1439 (4), 1465, 1488 (1), 1560.
Brown, Francis, 1461.
Brown, G. P., 363.
Brown, J. F., 293.
Brown, J. S., 863, 1213.
Brown, R. P., 1576.
Brown, William, 471.
BROWN UNIVERSITY, 1575-1577.
Brown university teachers' association, 121.
Browning, Oscar, 355.
Brubaker, H. C., 1022.
Bruce, H. A. B., 506.
Bruce, P. A., 202.
Bruce, W. G., 1023.
Bruchmüller, Wilhelm, 1622.
Brumbaugh, E. V., 1214.
Brumbaugh, M. G., 159*e* (8), 159*g* (7), 1174.
Bruner, F. G., 107 (50), 107 (149).
BRUSSELS. UNIVERSITY, 1618.
Bryant, Louise S., 1077.
Bryce, James, 688 (1).
Buchner, E. F., 472, 794 (4), 860.
Buckham, M. H., 751.
Buckley, Jeanette, 1313 (10).
Buckley, Sara C., 436.
Budde, Gerhard, 294.
Bullard, R. L., 267.
Bullock, A. A., 326.
Bumstead, H. A., 888.
Bund deutscher taubstummenlehrer, 1510.
Bunger, C. S., 637.
Bunker, F. F., 941.
Burch, H. R., 568, 688 (7).
Bureau of municipal research, New York, 233, 979.
Burk, Frederic, 234.
Burke, J. E., 107 (10).
Burke, J. F., 1112 (28).
Burks, J. D., 107 (37).
Burnett, E. A., 1397 (10).
Burnham, Ernest, 552.
Burnham, W. H., 44, 73 (11), 514 (4), 538, 1041, 1049, 1076, 1121, 1189.
Burns, A. T., 1113.
Burr, W. H., 1429.
Burritt, E. G., 58, 437.
Burstall, Sara A., 1470.
Burton, E. D., 327, 331.
Bush-Brown, H. K., 1431 (4).
BUSINESS EDUCATION, 107 (114-117), 759, 1427.
Bustico, Guido, 1294.
BUSY WORK, 627-628.
Butler, N. M., 107 (3), 107 (8), 161 (6), 251, 352, 829, 871, 1279 (1).
Butler, Nathaniel, 1215.
Butterfield, K. L., 107 (34), 1397 (4).

Cable, Lucy L., 197.
Cabot, Ella L., 107 (27).
CAIRO. UNIVERSITY, 1628.
CALCUTTA. UNIVERSITY, 1627.
Caldwell, B. C., 116 (42).
Caldwell, O. W., 107 (128).
CALIFORNIA, medical education, 1073.
California city and county superintendents, 122; council of education, 123.
Call, A. D., 107 (26).
Callari, Luigi, 312.
CAMBRIDGE UNIVERSITY, 1595-1596, 1614.
Campbell, C. F. F., 1568.
Campbell, J. A., 295.
Campbell, Marian, 1526 (10).
CANADA, education of foreigners, 264.
CANFIELD, J. H., 107 (8).
Carlton, F. T., 389.
Carman, G. N., 799 (5), 1346.
Carnegie foundation for the advancement of teaching, 830-831, 849, 1441.
CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING, 797 (2-3), 827-832, 834-839, 842.
Carney, Frank, 1548.
Carney, Mabel, 553.

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Carpenter, F. G., 1471.
Carpenter, L. G., 1397 (3).
Carpenter, W. H., 1440 (4), 1603.
Carrington, T. S., 1092.
Carroll, C. F., 1183.
Carroll, M., 1431 (3).
Carrow, Fleming, 1438 (15).
Carruth, W. H., 805.
Cary, C. P., 107 (22), 170 (23), 363, 864.
Case, L. C., 1456.
Casey, Charlotte, 18.
Cassidy, M. A., 116 (46).
Castle, W. R., *jr.*, 1153.
Catholic educational association, 92.
Cattell, J. McK., 252, 832, 877.
Cellérier, Lucien, 390.
CENTRAL AMERICA, history of education, 266.
CENTRALIZATION OF SCHOOLS, 96 (7), 119 (4), 126 (4), 988–991.
Chadsey, C. E., 107 (21).
Chamberlain, A. F., 833.
Chamberlain, A. H., 391.
Chambers, W. G., 12.
Chancellor, W. E., 107 (23), 161 (5), 941.
Chantavoine, L. H., 392.
Chapman, A. E., 25, 594.
Chapman, C. B., 116 (52).
Chapman, J. J., 203, 806, 1581.
Charles, F. L., 607.
Charters, W. W., 438.
Chartier, Suzanne, 1099.
CHEMISTRY, 729–734, 800 (9), 892, 897.
Cherry, H. H., 116 (44).
Chesterton, Thomas, 1135.
CHICAGO, education, 1015.
Child, C. G., 794 (8).
Child conference for research and welfare, 491.
CHILD LABOR AND EDUCATION, 1200–1207, 1358.
CHILD PSYCHOLOGY, 504–512.
CHILD STUDY, 107 (118–121), 116 (62), 491–503, 1045 (20).
CHILD WELFARE, 1200–1207.
CHILDREN'S BUREAU. *See* FEDERAL CHILDREN'S BUREAU.
CHILDREN'S GARDENS. *See* SCHOOL GARDENS.
CHILE, history of education, 268.
CHINA, education, 326–329, 1496.
CHINESE STUDENTS, 179 (14), 1496.
Chipman, G. F., 264.
Christian, H. A., 1442.
Church, E. M., 1314 (9).
Church, S. H., 1432 (20).
CHURCH AND EDUCATION, 96 (12), 1269–1277.
CINCINNATI, continuation school, 1363 (6).
CITIZENSHIP, 96 (13), 107 (3), 1174–1177.
CIVIC CLUBS. *See* SOCIAL CENTERS.
CIVICS, 694–698.
Claiborne, J. H., 1525 (8).
Claparède, E., 5, 507.
Clark, Frances E., 1455 (7).
Clark, Ida H., 1094, 1313 (18), 1322.
Clark university, Worcester, Mass., 393.
Classical conference, 1286.
CLASSICAL EDUCATION. *See* HUMANISTIC EDUCATION.
CLASSIFICATION AND GRADING, 1002–1003.
Claxton, P. P., 95 (17), 116 (2), 152 (1).
CLEANING AND DISINFECTING, 1041–1043.
Cleveland, board of education, 269, 569–570, 941; public library, 1562.
CLEVELAND, medical inspection, 1074.
Clopath, Henriette, 1314 (17).
Cloyd, D. E., 760.
Cobb, C. A., 96 (5).
Cockerell, T. D. A., 356.
Coe, G. A., 1233–1234.
CO-EDUCATION, 1483–1487.
Coffeen, E. L., 1526 (3).
Colby, Lou E., 622.
Cole, C. N., 852.
Cole, P. R., 192.
Colgrove, C. P., 439.
COLLEGE ARCHITECTURE, 1037.
COLLEGE DISCIPLINE, 796 (2).
COLLEGE EFFICIENCY, 8, 852.
COLLEGE ENTRANCE EXAMINATIONS, 794 (8–9), 876.
COLLEGE ENTRANCE REQUIREMENTS, 107 (22), 116 (26), 643 (5), 794 (7), 797 (2), 798 (5), 830 (7), 870–875.
COLLEGE FRATERNITIES. *See* FRATERNITIES, college.
COLLEGES. *See* UNIVERSITIES AND COLLEGES.
COLLEGIATE EDUCATION. *See* HIGHER EDUCATION.
Collier, A. B., 714.
Collins, J. V., 617.
Columbia university, 1443.
COLUMBIA UNIVERSITY, 1429.
Colvin, S. S., 473–474.
Colwell, N. P., 1444.
COMMERCIAL EDUCATION. *See* BUSINESS EDUCATION.
Committee of eight, 589.
COMMITTEE OF FIVE, 603.
Compayré, Gabriel, 357, 364.
COMPOSITION AND LANGUAGE STUDY, 116 (4), 582–587, 668–673.
COMPULSORY EDUCATION, 116 (52), 1019, 1542–1543.
CONCILIATION, INTERNATIONAL, 1279–1285.
Conference for education in Texas, 124, 1024; educational commission, 922.
Conference for education in the South, 95–96.
Conference for the study of the problems of rural life, 547–548.
Conference of church workers in state universities, 1252.
Conference on agricultural science, 1398.
CONSOLIDATION OF SCHOOLS, 96 (7), 119 (4), 126 (4), 988–991.
CONTAGIOUS DISEASES, 1076, 116 (16).
CONTINUATION SCHOOLS, 1363 (3), 1542–1545.
Conway, Martin, 1187 (5).
Conwell, R. H., 1112 (12).
Cook, A. A., 590.
Cook, F. L., 944.
Cook, G. B., 95 (5), 96 (29).
Cook, H. R. M., 980.
Cook, J. W., 107 (59), 107 (71), 130 (5).
COOKING. *See* DOMESTIC SCIENCE.
Cooley, E. G., 107 (61), 235.
Cooley, M. E., 1428 (11).
Coon, C. L., 95 (14), 116 (37).
Coontz, J. A., 945.
Cooper, C. S., 1253–1254.
CO-OPERATION, INTERNATIONAL, 107 (58).
CO-OPERATIVE SYSTEM. *See* INDUSTRIAL EDUCATION, co-operative system.
Cope, H. F., 96 (12), 1216.

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Cordley, A. B., 1397 (11).
Cornell, W. S., 1050.
CORNELL UNIVERSITY, 1579.
Cornman, O. P., 159c (10), 946.
CORPORAL PUNISHMENT. *See* PUNISHMENT.
Corson, O. T., 1068, 152 (3).
Coulomb, C. A., 690.
Coulter, E. K., 1525 (16).
Coulter, J. L., 95 (8).
Councilman, W. T., 1438 (6), 1445.
COUNTRY SCHOOLS. *See* RURAL SCHOOLS.
COURSE OF STUDY. *See* CURRICULUM.
Coutts, James, 1600.
Coy, E. W., 798 (1).
Crabbe, J. G., 96 (30).
Cradock, *Mrs.* H. C., 494.
Cramaussel, Edmond, 508.
Cramer, A., 495.
Crampton, C. W., 1045 (4), 1045 (18), 1525 (9).
Crane, R. T., 807.
Creighton, J. E., 850.
Creveling, H. L., 440.
CRIPPLED CHILDREN, 1524.
Cronin, J. J., 1045 (23).
Crosby, D. J., 107 (163–164), 1403.
Cross, C. W., 1339 (9).
Cross, H. R., 1314 (18).
Crossley, F. B., 1436 (2).
Crowley, R. H., 1051.
CUBA, history of education, 267.
Cubberley, E. P., 205.
CURRICULUM, elementary education, 107 (15–16), 567–641; higher education, 877–899; secondary education, 116 (41), 661–759. *See also under specific subjects.*
Curtis, Elnora W., 1093.
Cushing, J. P., 834.
Cuthbertson, David, 1597.
Czily, A., 1504.

Damm, P. F., 1389.
Damseaux, Eugène, 183.
Daniels, F. H., 623.
Danks, William, 1235.
Darlington, Thomas, 48, 319.
DARTMOUTH COLLEGE, 1580.
DARWIN, C. R., 356.
Davenport, Eugene, 107 (35), 107 (76), 163 (3), 163 (27), 799 (4), 1397 (12).
Davidson, Isobel, 1044.
Davies, Emily, 1472.
Davis, B. M., 3, 1323, 1404.
Davis, Maud F., 1203.
Davis, J. N., 647.
DAVIS BILL, 107 (89).
Davison, Alvin, 1042.
Davison, J., 777.
Dawson, G. E., 1236.
Dawson, Jean, 736.
Day, E. D., 1313 (12).
Day, J. R., 1142.
DEAF, 92 (4), 107 (48), 1045 (7–8), 1504, 1508–1523.
Deahl, J. N., 116 (62).
Dean, A. D., 149 (18), 908 (2), 1295, 1339 (8), 1347–1348.
Dearborn, W. F., 73 (5), 1002–1003, 1007.
De Catur, W. J., 1312 (2).
DEFECTIVE CHILDREN. *See* BACKWARD CHILDREN.
De Forest, F. M., 872.
De Garmo, Charles, 175 (2–3), 1339 (6).
Degenhart, A., 340.
DEGREES, 905.
De Lee, J. B., 1438 (10).
DELINQUENT CHILDREN. *See* BACKWARD CHILDREN; MORALLY DEFECTIVE CHILDREN.
De Montmorency, J. E. G., 996.
Dennis, H. V. M., 972.
DENOMINATIONAL SCHOOLS AND COLLEGES, 116 (25) 134 (6), 1277.
Derleth, Charles, *jr.*, 1428 (9), 1428 (14).
Derthick, F. A., 554.
Desagher, Maurice, 1505.
De Schweinitz, G. E., 1438 (11).
De Sélincourt, Hugh, 1604.
DESIGN, 1313 (11), 1314 (11), 1432 (23).
DESTITUTE CHILDREN, 1500.
Detroit board of education, 270.
Deutsche verein für schulgesundheitspflege, 1046.
Dewey, John, 73 (1), 475.
Dewing, A. S., 878.
De Witt, Katherine, 1452 (8).
Dexter, E. G., 107 (7).
Diaz, R. B., 206.
Dicey, Edward, 332.
Dickson, V. E., 661.
Diemer, Hugo, 1428 (10).
Dillard, J. H., 116 (8), 1490–1491.
Dinsmore, J. W., 540.
DIPLOMACY, 896.
DIRECTORIES, 180–181.
DISCIPLINE, 796 (2), 992–997, 1231, 1526 (2).
DISTRICT OF COLUMBIA, education, 909, 1025
Dock, G., 1438 (8).
DOCUMENTS, 46–47, 179.
Dodd, A. E., 1296, 1312 (4), 1432 (18).
Dodd, W. F., 909.
Dodge, W. C., 1025.
DOMESTIC SCIENCE, 96 (27), 1312 (7), 1314 (13–14), 1414–1425, 1432 (17); colleges, 1414 (2), 1416, 1419–1420, 1422; elementary schools, 1312 (8), 1313 (15), 1432 (15); high schools, 1432 (16).
Dooley, W. H., 1349.
Doster, J. J., 96 (21).
Douglass, H. P., 1492.
Dow, A. W., 1432 (23).
Downey, J. E., 207.
Downing, A. S., 107 (57), 1377.
Downing, B. C., 1528.
Draper, A. S., 139 (1), 150 (4), 394–395, 1350, 1405.
DRAWING. *See* ART; FINE ARTS.
Dreher, E. S., 107 (47).
Drescher, J., 1190.
Droescher, Lili, 496, 504.
Drury, H. N., 695.
Dubois, N. A., 441, 730.
Dudley, Elizabeth, 682.
Dudley, Gertrude, 1122.
Dufestel, L., 52, 1052, 1069.
Dugas, L., 396.
Duggan, S. P., 1550.
Dunlway, C. O., 797 (7).
Durand, Ralph, 1605.
Durfee, Annie B., 1432 (15).

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Dwight, Frederick, 1154.
Dyer, F. B., 1363 (3).

Earhart, Lida B., 467, 576.
Earle, E. L., 519–520.
EARS OF SCHOOL CHILDREN, 1082–1083.
Eastern art teachers' association, 1432.
Eastern association of physics teachers, 724–726.
Eastern manual training association, 312, 1432.
Eaton, E. D., 798 (3).
Eaton, Ethel M., 521.
Eaton, J. S., 1351.
ÉCOLE DES MÈRES, 1197.
ECONOMICS, 139 (5), 688 (7), 699, 800 (7).
Edinburgh. University. Students' representative council. International academic committee, 902
EDINBURGH. UNIVERSITY, 1597.
Edmiston, Homer, 1288.
Edmonds, F. S., 1578.
Edson, A. W., 49, 236, 1525 (2).
EDUCATION AND DEMOCRACY, 116 (44).
EDUCATION AND HEREDITY, 140 (3–5).
EDUCATION AND LIFE, 1178–1180.
EDUCATION AND PEACE, 107 (5).
EDUCATION AND SOCIETY, 1174–1177.
EDUCATION AND THE CHURCH, 96 (12), 1269–1277.
EDUCATION AND THE STATE, 107 (65), 116 (15), 116 (50), 145 (4), 797 (6), 932, 953.
EDUCATION EXTENSION, 1542–1572.
EDUCATIONAL PSYCHOLOGY, 116 (59), 116 (64), 469–512.
Educational settlement committee. Executive committee, 276.
Eggleston, J. D., *jr.*, 96 (7), 167 (1).
Ehler, G. W., 1045 (6).
Ehrenfeld, C. L., 778.
Eldred, C. H., 752.
ELECTIVE SYSTEM, 877–879, 881–884. *See also* GROUP SYSTEM.
ELEMENTARY EDUCATION, 107 (70–74), 539–641, 798 (7). *See also* KINDERGARTEN; PRIMARY EDUCATION; *and under countries.*
Elford, Percy, 1100.
Eliot, C. W., 397–398, 442, 947, 1435.
Elliott, E. C., 35, 907, 908 (1), 968, 1378.
Ellis, A. C., 95 (15).
Ellis, Florence, 1313 (20).
Elson, W. H., 107 (105), 157 (5), 569–573, 624, 981–982.
Emerson, E. C., 116 (57).
Emerson, Philip, 1101, 1111.
Engeln, O. D. von, 1579.
ENGINEERING EDUCATION, 144 (32), 169 (9–12), 1428–1429.
ENGLAND, educational legislation, 929–931.
ENGLISH LANGUAGE, 582–587, 668–673. *See also* LITERATURE.
Enright, Edmund, 1488 (4).
Erd, R. L., 1045 (8).
Erdman, Bertha, 1452 (4).
ETHICAL EDUCATION. *See* MORAL AND ETHICAL EDUCATION.
ETON COLLEGE, 1598–1599.
Eulenburg, Franz, 1623.
EUROPE, 269–322.
Evans, C. S., 1390.
Evans, H. R., 14.
Evans, W. A., 1053.
EVENING SCHOOLS, 1546–1547.

EXCEPTIONAL CHILDREN, 1525 (13). *See also* BACKWARD CHILDREN.
EXPERIMENT STATIONS. *See* AGRICULTURAL EDUCATION, colleges.
EXTENSION, EDUCATION. *See* EDUCATION EXTENSION.
EYES OF SCHOOL CHILDREN, 116 (17), 1081–1082.

Faifofer, Fanny, 522.
Failla, F. N., 313.
Fairchild, E. T., 107 (63).
Fairman, C. G., 1497.
Falkner, R. P., 983, 1008.
Farnsworth, C. H., 631.
Farrell, Elizabeth E., 1536.
Farrington, F. E., 24, 289.
Faunce, W. H. P., 159 (2), 1269 (5).
Favill, H. B., 107 (9), 1054, 1201.
Fechner, K., 296.
FEDERAL BUREAU OF EDUCATION. *See* UNITED STATES BUREAU OF EDUCATION.
FEDERAL CHILDREN'S BUREAU, 1260 (1), 1201, 1205, 1207, 1452 (13).
FEEBLE - MINDED. *See* BACKWARD CHILDREN; MENTALLY DEFECTIVE CHILDREN.
FEEDING OF SCHOOL CHILDREN, 1077–1080.
Felkin, F. W., 1616.
Fell, L. A., 948.
Felmley, David, 107 (39).
Fenwick, Ethel G., 1454.
Ferguson, James, 1379.
Fernández y Fernández-Navamuel, Manuel, 523.
Ferreri, Giulio, 1513–1514.
Fess, S. D., 1281.
FESTIVALS. *See* SPECIAL DAYS.
Fiedler, H. G., 889.
FINE ARTS, 1430–1435. *See also* ART.
Finley, J. H., 879.
Firth, C. H., 1606–1607.
Fishburg, Maurice, 1525 (15).
Fisher, G. J., 796 (3), 1112 (22).
Fisher, Mary, 667.
FITCHBURG PLAN, industrial education, 799 (3), 1363 (1), 1381.
Fitzpatrick, F. A., 365.
FLAG DAY, 1148.
Fleet, C. J., 1187 (10).
Fleming, Ada M., 1457.
Fleming, D. J., 333.
Fletcher, *Mrs.* J., 96 (15).
Fletcher, Robert, 1391, 1428 (7).
Flexner, Abraham, 1446.
Flexner, B., 1526 (8).
Flexner, Mary, 1297.
Flury, Elise, 443.
Foght, H. W., 555, 949.
FOLK DANCING. *See* PLAYS, GAMES, ETC.
Folwell, W. W., 208.
Foos, C. S., 159 (1), 179 (18), 1328.
FOOTBALL, 1145.
Foote, A. R., 950.
Forbes, E. A., 1447.
Forbes, G. M., 1339 (7).
Ford, G. B., 1426.
Ford, Walter, 1187 (7).
FOREIGN STUDY, 900–904.
FORESTRY, 131 (9), 133 (23), 135 (1).

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Formiggini-Santamaria, E., 314, 509
Forsyth, David, 1055.
Foster, E. C., 1264.
Foster, J. W., 1286, 1496.
Foster, W. T., 253, 880.
FOURTH OF JULY CELEBRATION, 1112 (5).
FRANCE, educational legislation, 932; history of education, 288–292.
Francis, Alexander, 209.
Frank, Ferdinand, 190.
Franklin, Fabian, 358.
FRATERNITIES, college, 794 (1), 800 (2), 1166–1168, 1260; high school, 146 (7), 159 h (1), 1169.
Frazier, C. H., 1438 (9).
Freeman, Virginia W., 1069.
FRENCH. *See* LANGUAGES, modern.
Frere, Margaret, 1204.
Freund, Ida, 714.
Friedel, V. H., 271.
FRIENDS, education, 1277.
Frost, J. M., 107 (43).
Fryer, John, 179 (29).
Fuld, L. F., 984, 1136.
Fullan, M. T., 116 (56).
Fuller, Bampfylde, 1237.

Gabriel, Edmond, 444.
Gailor, T. F., 1269.
Gallinger, J. H., 210.
Galloway, T. W., 739.
GAMES. *See* PLAYS, GAMES, ETC.
Ganong, W. F., 735.
Gansberg, Fritz, 399.
GARDENS. *See* SCHOOL GARDENS.
Gardiner, J. H., 669, 866.
Garman, C. C., 917.
Garnett, Lucy M. J., 323.
Gass, H. A., 211.
Gaudig, Hugo, 400.
GAUFRÈS, JULES, 357.
Gayley, C. M., 212.
Gaylor, G. W., 1009.
Gearhart, May, 1314 (2).
GEOGRAPHY, 594–601, 688 (1), 688 (5), 700–701.
GEOMETRY, 712–713.
George, W. R., 1020.
Georgia educational association, 126–127.
Gephart, W. F., 213.
Gerini, G. B., 347.
GERMAN. *See* LANGUAGES, modern.
GERMANY, higher education, 309–310; history of education, 293–310; industrial education, 1314 (20), 1352, 1357; technical education, 1389, 1395.
Gerwig, G. W., 1432 (25).
Ghosh, J., 334.
Gibbs, C. M., 1313 (13), 1313 (15).
Gibson, C. B., 107 (43), 116 (11).
Giddings, F. H., 643 (1).
Gideon, A., 676.
Gilbey, Walter, 1551.
Gilchrist, Beth B., 372.
Gill, Laura D., 107 (2).
Gillette, J. M., 1298.
GILMAN, D. C., 358–359.
Ginever, Ilona de G., 1187 (16).
Ginn, Edwin, 986, 1282.
GIRLS, education. *See* WOMEN, education.
GLASGOW. UNIVERSITY, 1600.
Goblet d'Alviella, E. F. A., 1618.
Goddard, M. F., 643 (4).
Going, C. B., 1428 (4).
Golden, John, 78 (4).
Goldrich, L. W., 618.
Goldsmith, E. M., 179 (28).
Gonzalez, L. F., 648.
Gonzalez Carreño, Genaro, 741.
Goodhart, S. P., 1525 (11).
Goodrich, Henrietta I., 1415.
Goodwin, F. P., 696.
Gordy, W. F., 107 (5), 1279 (3).
Gore, *Dr.*, 1187 (9).
Gore, C. H., 1191.
Gould, F. J., 1217.
GRADING, 1002–1003. *See also* PROMOTION OF PUPILS.
Graham, A. B., 556, 988.
Graham, John, 116 (29).
Grant, Cecil, 1484.
Graves, F. P., 195.
Gray, *Mrs.* Edwin, 1187 (4).
Gray, H. B., 1238.
Gray, Helen S., 1416.
Gray, J. C., 619.
Great Britain, board of education, 1324, 1542, 1546; Scotch education department, 632.
GREAT BRITAIN, higher education, 287; history of education, 274–287; secondary education, 284–286; technical education, 1395.
GREEK. *See* HUMANISTIC EDUCATION.
Green, J. M., 768.
Greene, Maria L., 50, 1102.
Greene, Mary B., 1529.
Greenwood, J. M., 107 (18), 107 (54), 144 (4), 366, 1218, 1279 (2).
Greeson, W. A., 798 (7).
Gribble, F. H., 1608.
Grice, Mary Van M., 1192.
Griffin, N. E., 855.
Groszmann, M. P. E., 1525 (13), 1525 (17), 1530.
GROUP SYSTEM, 133 (7), 116 (41). *See also* ELECTIVE SYSTEM.
Gulick, L. H., 107 (53), 159e (6), 159e (9), 170 (15), 1010, 1045 (22), 1112 (10).
Gunnels, H. C., 96 (28).
Gurlitt, Ludwig, 445, 1193.
Gurnaud, D., 290.
Gwinn, J. M., 779.
GYMNASTICS. *See* PHYSICAL EDUCATION.

Haas, J. A. W., 1270.
Haas, S. V., 1525 (12).
Haase, Hermann, 401.
Hadley, A. T., 1155.
Haese, Arthur, 1352.
HAILEYBURY COLLEGE, 1601.
Hall, A. C., 800 (6).
Hall, Bert, 107 (24).
Hall, Bolton, 1103.
Hall, E. H., 890.
Hall, G. S., 497.
Hall, W. S., 742–743.
Hamer, F. E., 277.

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Hamilton, C. G., 1455 (2).
Hamilton, S., 1432 (22).
Hamlin, Lenora A., 1104.
Hammerschlag, A. A., 1432 (11).
HAMPSTEAD. UNIVERSITY COLLEGE SCHOOL, 1616.
Hampton, Va., Normal and agricultural institute, 1493.
Haney, J. P., 1353, 1432 (5).
Hanmer, L. F., 149 (44), 1112 (23).
Hanna, J. C., 1219.
Hanus, P. H., 1380.
Harbourt, S. A., 753.
Hard, William, 1169.
Harding, B. F., 649.
Harding, C. F., 1194.
Harman, A. F., 951.
Harmant, Émile, 1417.
Harmon, N. B., 1043.
Harmon, W. E., 1114.
Harrington, T. F., 78 (2), 1045 (1).
Harris, M. O'B., 541.
Harris, T. H., 96 (8).
HARRIS, W. T., 360-370, 144 (4-5), 515 (9).
Harrison, S. M., 1021.
Harry, J. E., 800 (3).
Hart, A. B., 214.
Hart, H. H., 1112 (29), 1526 (11), 1539.
Hart, J. K., 1220.
Hart, W. R., 638, 1398 (2).
Harvard university. Associated Harvard clubs, 952.
HARVARD UNIVERSITY, 813, 877, 879, 881, 883, 1581-1583.
Harvey, L. D., 96 (3), 107 (1).
Harvey, N. A., 446.
Haserot, F. H., 650.
Haskell, S. B., 1398 (5).
HASKELL INSTITUTE, 1488 (2).
Hastings, W. W., 1045 (10), 1123.
Hatt, W. K., 1428 (12).
Hay, Helen S., 1452 (7).
Hayes, C. H., 891.
Hayes, Ellen, 1473.
Hays, W. M., 557-558.
Hayward, F. H., 524, 993.
Hazard, Caroline, 1255.
Hazeltine, H. D., 1436 (1).
Headlam, J. W., 683.
Heaton, Samuel, 1100.
Hebert, Georges, 1124-1125.
Heck, W. H., 476.
Hecker, E. A., 684.
Heermans, Josephine, 591.
Heeter, S. L., 246, 1056.
Heffron, J. L., 744.
Heigenmooser, Joseph, 184
HEINICKE, SAMUEL, 1520
Heller, O., 1314 (15).
Helm, Johann, 447.
Heman, Friedrich, 198.
Henderson, C. H., 1299
Henderson, C. R., 1201
Hendrick, B. J., 1095.
Hendrick, Welland, 774.
Henneman, J. B., 795 (1).
HEREDITY AND EDUCATION, 140 (3-5).
Heron, David, 498.
Hetherington, C. W., 1115.
Heubaum, Alfred, 377.
Heydrick, B. A., 643 (5).
Heyl, C. C., 835.
Hickey, E. M., 1070.
Higgins, Myrta M., 1105.
Higgs, Mary, 510.
HIGH SCHOOL AND COLLEGE, 107 (19-23), 119 (53), 135 (6), 143 (10), 143 (12-13), 644 (3), 797 (7), 799 (6), 830 (6), 863-869, 876.
High school teachers' association of Los Angeles, 642.
High school teachers' association of New York City, 643-644, 865, 1300-1302.
HIGH SCHOOLS. *See* FRATERNITIES, high school; HIGH SCHOOL AND COLLEGE; SECONDARY EDUCATION; UNITED STATES, secondary education.
HIGHER EDUCATION, 73 (10), 107 (19-20), 107 (84-85) 116 (20-21), 793-905; organization and methods, 855-857; standardization, 858-862, *see also* UNIT SYSTEM; supervision and administration, 846-854. *See also* HIGH SCHOOL AND COLLEGE; UNIVERSITIES AND COLLEGES, *and under countries.*
HIGHER EDUCATION ASSOCIATION, 73 (9).
Highsmith, J. H., 788.
Hill, *Mrs.* Southwood, 448.
Hillis, Annie P., 1474.
Hillyer, T. A., 107 (92).
Hinsdale, Ellen C., 903, 1485.
HISTORY, 116 (5), 589-593, 687-693, 891.
HISTORY OF EDUCATION, 182-191; ancient, 192-194; medieval, 195-196; modern, 197-199.
Hoare, J. W , 608.
Hoban, C. F., 278.
Hobbs, L. L., 1280 (6).
Hobbs, W. H., 836.
Hobson, Sarah, 1078.
Hodgson, *Miss* G. E., 1187 (12).
Hodson, F , 715.
Höfler, Alois, 703.
Hötzsch, Otto, 904.
Hogarth, A. H., 1071.
HOLLAND, education, 311.
Hollembeak, J. R., 237.
Holliday, Carl, 238, 402, 1271.
Hollowell, W. R., 96 (13).
Holmes, J. H., 1239.
Holtz, F. L., 609.
HOME AND SCHOOL, 96 (16), 107 (54), 116 (68), 1186-1199, 1398 (2).
Hood, A. C., 582.
Hoover, W. I. T., 116 (67).
Hope, A. H., 284.
Hopkins, C. G., 716.
Hopkins, E. M., 254.
Hopkins, Florence M., 1563.
Hopkins, J. F., 1431 (1).
Hopkins, P. A., 116 (54).
Hori, Tatsu, 341.
Horn, P. W., 116 (50), 953.
Hornaday, W. T., 740.
Horne, H. H., 789, 1045 (2), 1525 (6).
Hotchkiss, H. V., 107 (46).
Hovestadt, H., 707.
Howe, S. G., 1506.
Howell, W. H., 1448.
Hubbard, G. D., 700.
Hubbell, G. A., 373.

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Huddleston, *Mrs.* J. H., 1463 (2).
Hufford, Lois G., 525.
Hugh, D. D., 989.
Hughes, E. H., 697.
Hughes, E. L., 116 (47).
Hughes, J. L., 577, 1221.
Hughes, R. M., 800 (2).
Huizinga, Henry, 335.
Hulton, S. F., 1609.
HUMANISTIC EDUCATION, 588, 800 (8), 1286–1292.
HUMBOLDT, WILHELM VON, 371.
Humphreys, W. J., 403.
Hunt, E. L., 1525 (10).
Hunter, G. W., 737.
Hunter, W. B., 799 (3), 1363 (1), 1381.
Huntington, E. V., 1428 (2).
Hurd, W. D., 1419.
Hurty, J. N., 1045 (14).
Hutchinson, Woods, 107 (32).
Hyde, W. D., 449, 808, 856.
HYGIENE, 96 (11), 107 (9), 1123. *See also* MEDICAL INSPECTION OF SCHOOLS; PHYSIOLOGY AND HYGIENE; SCHOOL HYGIENE.

Illinois, department of public instruction, 559; educational commission, 910; state teachers' association, 130–131.
ILOILO TRADES SCHOOL, 1354.
IMMIGRANTS, 1497–1499.
In-Young, 328.
Incorporated association of assistant masters in secondary schools, 974.
INDIA, education, 330–339.
INDIANA, school hygiene, 1045 (14).
Indiana state teachers' association, 132.
INDIANS, 107 (150–159), 1488–1489.
INDIVIDUAL INSTRUCTION, 107 (17).
INDUSTRIAL EDUCATION, 78 (8), 95 (5), 107 (1), 107 (34–37), 107 (41), 116 (11), 116 (55), 139 (1), 149 (18), 799 (1), 1335–1387; cooperative system, 131 (18), 1346, 1363 (2), 1432 (26); elementary schools, 107 (42), 107 (57); high schools, 78 (12), 107 (43); normal schools, 78 (11); rural schools, 119 (22), 132 (3–7), 158 (9), 1323. *See also* MANUAL TRAINING; TECHNICAL EDUCATION; TRADE EDUCATION; WOMEN, industrial education, *and under names of countries*.
International commission on secondary mathematics, 704.
International commission on the teaching of mathematics, 705–706.
International congress for the development of drawing and art teaching, 1433.
INTERNATIONAL CONGRESS FOR THE DEVELOPMENT OF DRAWING AND ART TEACHING, *3d*, 107 (104), 1432 (14), 1432 (24).
INTERNATIONAL CO-OPERATION. *See* CO-OPERATION, INTERNATIONAL.
INTERNATIONAL EXCHANGE OF TEACHERS, 792, 830 (1).
International kindergarten union, 514–515.
IOWA, rural schools, 96 (6).
Iowa state teachers' association, 133–134.
IOWA STATE UNIVERSITY, 1258.
IRELAND, domestic science, 1414.
IRELAND. NATIONAL UNIVERSITY, 1602.
Italy. Commissione reale per l'ordinamento degli studi secondari in Italia, 936.
ITALY, education, 312–318; educational legislation, 935–936; higher education, 1256.
Ives, Herbert, 354.
Ivins, L. S., 639.

Jackson, C. R. H., 1112 (26).
Jackson, G. L., 215.
Jahn, M., 41, 1240.
James, H. R., 761.
JAPAN, education, 340–345; women, education, 1471.
Jarman, J. L., 116 (43).
Jastrow, Joseph, 837, 1314 (16).
Jayne, J. W., 116 (36).
JEANES FUND, 1490.
Jenkins, Mabel I., 1475.
Jenks, F. B., 78 (6).
JEWS, education, 325.
Johnson, D. B., 96 (23).
Johnson, F. W., 651.
Johnson, G. E., 107 (31), 1112 (15), 1000.
Johnson, *Mrs.* G. T., 1079.
Johnson, Grace, 1526 (14).
Johnson, L. C., 1126.
Johnson, Lilian W., 95 (11).
Johnson, R. B., 1595.
Johnston, Hugh, 1272.
Johnston, W. D., 150 (2), 1564–1565.
Jonas, J. A., 404.
Jones, A. T., 1241.
Jones, E. A., 157 (9), 158 (2).
Jones, L. W., 892.
Jones, Olive M., 107 (49), 1531.
Jones, T. J., 116 (6).
Jordan, D. S., 405, 861, 1156, 1166.
Jordan, E. O., 309.
Jordan, L. H., 1256.
Jordan, R. H., 116 (41).
Joyner, J. Y., 95 (18), 96 (6), 119 (7), 153 (9).
Judd, C. H., 73 (3), 652, 790, 799 (6).
Judson, H. P., 119 (8), 1436 (3).
JUVENILE COURTS, 1526 (8), 1526 (10).

Kämmel, Otto, 297.
Kanda, Naibu, 342.
Kandel, I. L., 574.
Keatinge, M. W., 691.
Keene, C. H., 1127.
Keffer, C. A., 96 (22).
Kellar, Frances A., 1122.
Kellerman, Ivy, 1273.
Kelley, Florence, 1201.
Kelly, R. L., 1277.
Kemp, E. W., 592.
Kennard, Beulah, 1112 (6).
Kennedy, Joseph, 873.
Kent, E. B., 1382.
Kentucky educational association, 135.
KENTUCKY EDUCATIONAL COMMISSION, 912.
Kenyon-Warner, E. E., 578.
Keppel, F. P., 1157.
Kergomard, Pauline R., 1195.
Kerr, John, 279.
Kerschensteiner, Georg, 698, 954.
Key, Ellen, 406.
Keyes, Alicia M., 1432 (6).
Keyes, C. H., 107 (64).
Kikuchi, Dairoku, 343.
Killing, W. K. J., 707.

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Kilpatrick, W. H., 216.
Kimball, D. S., 1363 (7).
Kimmins, C. W., 1355.
KINDERGARTEN, 107 (66–69), 116 (68), 133 (14), 514–538, 1105, 1140. *See also* PRIMARY EDUCATION.
Kindermann, Carl, 348.
Kindervater, A. E., 1045 (5).
King, H. C., 1208.
King, Lida S., 95 (13).
Kingsley, S. C., 1067.
Kinman, G. W., 975.
Kinne, Helen, 1420.
Kirby, G. T., 1112 (8).
Kirby, Lydia A., 1532.
Kirk, E. C., 1064.
Kirk, J. R., 107 (113).
Kirk, K. E., 336.
Kirkland, J. H., 1209.
Kirkpatrick, E. A., 499.
Kirtland, J. C., 870.
Knabe, Karl, 298.
Knapp, S. A., 96 (25).
Knight, H. B., 1414 (2).
Knorr, G. W., 990.
Koehler, H. J., 1143.
Kohn, A. D., 745.
Kornfield, J. S., 1116.
Krause, C. A., 677–678.
Kreuzpointner, Paul, 1356–1357.
Krogh, D. M. F., 1128, 1137.

Lablanca, Baldassare, 1256.
LABORATORY, university, 888.
Ladd, A. J., 762.
Lake Mohonk conference of friends of the Indian and other dependent peoples, 1488.
Lake Mohonk conference on international arbitration, 1280.
LAND GRANT COLLEGES. *See* AGRICULTURAL EDUCATION, colleges.
LANGUAGES, 588, 666; ancient, 681–686; modern, 78 (5), 674–680, 889. *See also* HUMANISTIC EDUCATION.
Lanier, H. W., 1096.
Latane, J. H , 796 (2).
Lathbury, D. C., 280.
LATIN, 92 (2). *See also* HUMANISTIC EDUCATION; LANGUAGES, ancient.
Lavrand, H., 477.
Laurie, S. S., 407.
LAW, 1436–1437.
Lawrence, F. B., 838.
Lay, G. W., 116 (35).
Leather, Herbert, 281, 1011, 1072.
Le Bon, Gustave, 478.
Lebrun, Hector, 1289.
Leckliter, *Mrs.* F. P., 239.
Leclère, Albert, 1222.
Lee, J. W., 240.
Lee, Joseph, 1112 (20).
LEGISLATION, LAWS, England, 929–931; France, 932, Germany 933–934; Italy, 935–936; United States; 906–928.
Legler, H. G., 1566.
Lehmer, D. N., 708.
Leipzig. University, 1624–1625.
LEIPZIG. UNIVERSITY, 1622–1625.
Leland, Arthur, 1117.
Leland, Lorna H., 1117.
Lembke, F., 1544.
Lennox, P. J., 1602.
Leslie, G. L., 1073.
Leupp, F. E., 1489.
Lewin, Heinrich, 299.
Lewis, F. T., 1449.
Lewis, G. G., 595.
Lewis, L. L., 640.
Lewis, L. R., 1455 (6).
Lewis, R. H., 96 (11).
Lewis, T. H., 913.
Lewis, W. D., 670, 866.
Lewis, W. J., 25, 594.
Liard, Louis, 1021.
LIBRARIES AND EDUCATION, 107 (139–143), 116 (61), 1555–1572.
LIBRARIES AND SCHOOLS, 133 (9), 138 (21), 141 (6), 144 (60), 147 (5), 149 (35), 149 (37–38), 150 (2), 157 (3), 1556, 1563, 1564, 1566, 1569, 1570, 1571.
LIBRARY TRAINING, 116 (12).
LIGHTING, schoolhouses, 1038–1040.
LILLIAN HOME, 1097.
Lindemann, A. S., 955.
Lindsay, S. M., 1201.
Lindsey, B. B., 107 (14), 107 (121), 107 (157), 1201.
Lipmann, Otto, 21, 479.
LITERATURE, 116 (3), 580–581, 667.
Litman, Simon, 699.
Livingston, Helen, 1432 (16).
Locke, A. Le R., 1610.
Lodge, Oliver, 1187 (1).
Lodge, T. H., 1303.
Lomer, G. R., 39, 450.
LONDON, school attendance, 1019; trade schools, 1355.
London county council. Education department, 583, 1057, 1085.
Long, E. H., 1440 (1).
Long, J. S., 1515.
Loomis, H. N., 780.
Lord, E. W., 1200 (2).
Louisiana. Conference of high school principals of public education, 136.
Louisiana. Conference of parish superintendents of public education, 137.
LOUVAIN AMERICAN COLLEGE, 1462.
Louvain. University, 1619.
LOUVAIN. UNIVERSITY, 1619–1620.
Love, J. K., 1516–1517.
Lovejoy, A. O., 839.
Lovejoy, O. R., 107 (119), 1200 (1), 1205, 1358.
Lowell, A. L., 809, 881, 1582.
Luckey, G. W. A., 1045 (11).
Lull, H. G., 662.
Lyon, E. P., 1438 (5).
LYON, MARY, 372.
Lyttelton, E., 663.

Mable, H. W., 1432 (2).
McAndrew, William, 451, 500, 653, 867.
McCarthy, M. R., 92 (4).
McCartney, L. M., 116 (48).
McClorey, J. A., 584.
MacCracken, H. M., 1586.
McCready, E. B., 1525 (7).
McCready, S. B., 1106.
McCurdy, J. H., 1045 (20).

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Macdonald, William, 810, 1549.
MACDONALD COLLEGE, 107 (6).
MACDONALD MOVEMENT, 1410.
McDonnell, M. F. J., 1615.
Macfeat, Minnie, 641.
McGaw, Virginia, 627.
McHugh, D. J., 92 (3).
McIlvaine, J. A., *jr.*, 1518.
McKee, R. H., 685.
McKeever, W. A., 452, 1304.
Mackenzie, Millicent, 408, 1223.
Mackenzie, J. S., 1223.
McKenzie, R. T., 1129.
Maclaurin, R. C., 717, 851, 1292.
MacLean, G. E., 797 (6), 1258.
McMurry, F. M., 468.
McMurry, O. L., 1314 (6).
McMurtrie, D. C., 1524.
MacNary, E. E., 1432 (19).
Macnaughton, Myra I. K., 1283.
McNeal, Florence A., 1526 (6).
McNeill, I. C., 116 (51).
McSweeney, E. F. X., 92 (1).
Macy, J. A., 1567.
Maennel, B., 9, 1533, 1540.
Magennis, Edward, 1081.
Magruder, W. T., 1359, 1428 (8).
Maguire, Margaret I., 1534.
Mahuteaux, A. E., 679.
Main, J. H. T., 811.
Main, Josiah, 107 (166), 754–756.
Maine committee on industrial education, 1360.
MANAGEMENT AND DISCIPLINE. *See* DISCIPLINE.
MANHATTAN TRADE SCHOOL FOR GIRLS, 1374.
Mann, C. R., 718, 727–728, 874, 893.
Mann, F. M., 1313 (6).
MANN, HORACE, 373.
Manny, F. A., 527–528, 875.
MANUAL ARTS. *See* MANUAL TRAINING; INDUSTRIAL EDUCATION; TRADE EDUCATION.
MANUAL TRAINING, 107 (94–101), 116 (54), 798 (6), 1312–1334, 1432 (19), 1432 (20). *See also* INDUSTRIAL EDUCATION.
Maphis, C. G., 923.
Mardis, S. K., 918.
Mark, C. W., 956.
Markert, Karl, 501.
Marks, Jeannette, 1476.
Marlborough, Consuelo, *duchess of*, 1477.
Marsden, R. E., 36, 1319.
Marshall, Ruth, 610.
Martin, *Lady* Carlaw, 1421.
Martindale, W. C., 1094.
Martzolff, C. L., 919.
Marx, G. H., 840.
Maryland commission on industrial education, 1361; state teachers' association, 138.
Mason, *Miss* C. M., 1187 (2).
Mason, D. G., 1458.
Mason, W. E., 78 (7).
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, 1388, 1584.
Massachusetts state board of education, 1406; state teachers' association, 139.
Masterson, J. H. B., 1187 (13).
MATHEMATICS, 702–713, 1428 (2). *See also* ARITHMETIC.
Mathews, E. B., 688 (5).
Matthews, Brander, 1568.
Matthews, Caroline, 315.
Matthews, E. C., 596.
Matthews, W. H., 1097.
Mattoon, J. C., 116 (55).
MAUCH CHUNK, education, 1018.
Maurer, Robert, 688 (3).
Maxwell, W. H., 107 (30), 349.
Mayer, A. G., 812.
Mead, G. H., 73 (4).
Meader, C. L., 320.
MEDICAL INSPECTION OF SCHOOLS, 107 (33), 116 (16), 1045 (23), 1067–1076. *See also* HYGIENE.
MEDICINE, 1438–1451.
MEDIEVAL EDUCATION, 195–196.
Melcher, George, 453.
Mell, P. H., 116 (26), 868.
Mendousse, P., 2, 502.
MENTALLY DEFECTIVE CHILDREN, 116 (66), 1525 (14), 1535–1538. *See also* BACKWARD CHILDREN.
MEREDITH, GEORGE, 374.
Meriam, J. L., 107 (16).
Merrill, L. A., 1396 (3).
Meserve, C. F., 116 (9).
Mestre, Aristides, 1583.
METHODS OF STUDY. *See* STUDY, METHODS OF.
MEXICO, school hygiene, 1059.
Meyer, M. T., 714.
Meyer, Max, 116 (65).
Meylan, G. L., 1045 (22), 1090.
MIAMI UNIVERSITY, 1585.
Michigan schoolmasters' club, 140; state teachers' association, 141.
MICHIGAN. UNIVERSITY, 1428 (11).
Miklas, Leopold, 38, 1535.
Mildren, Nan L., 628.
Milford, L. S., 1601.
MILITARY TRAINING, 895, 898.
Miller, C. A. A. J., 1012.
Miller, E. A., 800 (4), 1158.
Miller, H. A., 1178.
Miller, L. W., 1432 (24).
Miller, W. E., 116 (32).
Miller, W. T., 1305.
Milner, H. L., 686.
Miner, E. G., 1339 (4).
Minneapolis commercial club, 957.
Minnesota educational association, 142.
MINNESOTA. UNIVERSITY, 842.
Mirguet, V., 1478.
Missimer, H. C., 1013.
Mississippi teachers' association, 143.
Missouri state teachers' association, 144
Mitchell, S. C., 95 (3).
Mitchell, T. C., 794 (9).
Mittenzweh, L., 1306.
MODERN EDUCATION, 197–199.
Moffatt, J. D., 794 (6), 1274.
Monaghan, J. C., 1307.
Monaghan, J. P., 116 (27).
Monroe, W. S., 1525 (14).
Monroy, F. C., 454.
Montague, A. P., 116 (24).
Montessori, Maria, 529.
Montgomery, Louise, 1014.
Mooney, G. W., 217.
Moore, E. C., 969.
Moore, J. C., 1026.

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Moore, Sarah W., 1498.
MORAL AND ETHICAL EDUCATION, 107 (12-13), 107 (26-28), 1187 (11), 1208-1285.
MORALLY DEFECTIVE CHILDREN, 107 (14), 1539-1540.
MORALS, college, 134 (24), 135 (4), 800 (4), 1158, 1260; primary schools, 130 (16-17); secondary schools, 1213-1214, 1219, 1484.
Morgan, C. L., 480.
Morrison, Anna L., 1526 (4).
Morrison, H. C., 78 (1).
Morsch, H. E. A., 300.
MOTHERS' CIRCLES. *See* HOME AND SCHOOL.
Mowry, J. E., 78 (10).
Mowry, W. A., 367.
Moxom, P. S., 1280 (1).
Moyer, J. A., 1428 (11).
Müller, C., 301.
Münch, Wilhelm, 680, 1541.
Münsterberg, Hugo, 218, 255, 481.
Munford, *Mrs.* B. B., 95 (10).
Murphy, D. C., 994.
Murrah, W. B., 116 (19), 409.
Murrey, *Mrs.* T. P., 96 (14).
MUSEUMS, 1551.
MUSIC, 107 (108-113), 629-636, 1187 (7), 1455-1458.
Music teachers' national association, 1455.
Muzzey, David, 1225.
Myers, E. J., 474.
Myers, G. E., 1312 (3).
Mysore (India) Dept. of public instruction, 337.

Nasmyth, G. W., 1284.
Nathan, G. J., 1159.
National association for the study and education of exceptional children, 1525.
National association of manufacturers of the United States of America, 1362.
National association of state universities in the United States of America, 797.
National board for the promotion of rifle practice, 895.
National business league of America, 896.
National child labor committee, New York, 1200-1201.
NATIONAL CHILDREN'S BUREAU. *See* FEDERAL CHILDREN'S BUREAU.
National conference committee on standards of colleges and secondary schools, 858.
National conference on the education of backward, truant, and delinquent children, 1526.
National congress of mothers, 1196.
National education association, 174.
National education association of the United States, 107. Departments—art education, 107 (102-107); business education, 107 (114-117); child study, 107 (118-121); elementary education, 107 (70-74); higher education, 107 (84-85); Indian education, 107 (150-159); kindergarten education, 107 (66-69); library, 107 (139-143); manual training, 107 (94-101), 1383; music education, 107 (108-113), 1455 (7); normal schools, 107 (86-93); physical education, 107 (122-127); rural and agricultural education, 107 (160-167); school administration, 107 (136-138); science instruction, 107 (128-135); secondary education, 107 (75-83); special education, 107 (144-149); superintendence, 107 (15-47), 108; women's organizations, 107 (168-171). General session, 107 (1-14). National council of education, 107 (48-65).
NATIONAL EDUCATION OFFICE. *See* UNITED STATES BUREAU OF EDUCATION.
National league for physical education and improvement, 1130.
National metal trades association, 1363.
National society for the promotion of industrial education, 1335-1339.
NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION, 1353.
National society of college teachers of education, 785.
NATIONAL UNIVERSITY, IRELAND, 1602.
Natorp, Paul, 410, 482.
NATURE STUDY AND SCIENCE, 602-614, 1110, 1398 (1).
Nearing, Scott, 958, 1206.
Nebraska department of public instruction, 991.
Needham, C. W., 116 (21).
Neet, G. W., 455.
NEGROES, 95 (14), 116 (6-9), 116 (47), 1490-1495.
Nelson, B. E., 107 (45).
Neustaedter, M., 1525 (4).
New England association of chemistry teachers, 729.
New England association of school superintendents, 1058.
New South Wales. Department of Public instruction, 219.
NEW YORK CATHOLIC PROTECTORY, 1526 (15).
New York city, public schools, 1138.
New York (State), Associated academic principals, 146.
New York state association of school commissioners and superintendents, 147.
New York (State) Education department, 256, 908, 916, 1148.
New York state science teachers' association, 148.
New York state teachers' association, 149.
New York (State) University. University convocation, 150.
NEW YORK UNIVERSITY, 1586.
Newman, Carrie S., 530.
Newton, E. W., 633.
Nibecker, F. H., 1526 (16).
Nicolson, F. W., 1160.
Nishiyama, Sekiji, 344.
NORMAL SCHOOLS, 78 (9), 78 (11), 107 (86-93), 116 (42), 776-784.
NORMAL TRAINING, universities, 92, 785-791.
North Carolina association of city public school superintendents and principals, 151: teachers' assembly, 152-153.
North central association of colleges and secondary schools, 798-799.
North Dakota educational association, 154, 155.
Northrop, Cyrus, 220, 411, 1259.
Norton, A. P., 1314 (14).
Norton, W. H., 1068.
Norwood, Cyril, 284.
Noyes, William, 1325-1326.
NURSES, training, 1452-1454.

Oakeley, Hilda D., 1422.
OBERLIN, J. F., 375.
Oberlin college, 852, 1587.
OBERLIN COLLEGE, 1587.
Oberlin college faculty, 8.
O'Brien, Sara R., 1499.
OCCUPATIONS AND BUSY WORK, 627-628.
OHIO, colleges, 1158; laws, 917-919; rural schools, 988.
Ohio college association, 800; state teachers' association, 157, 158.

Digitized by Google

Okuma, Shigenobu, 345.
Oldt, F. T., 1027.
Olin, Helen R., 1486.
Oliver, C. A., 1265.
Oliver, J. P., 119 (16).
Olmstead, J. C., 116 (16).
Ontario educational association, 175.
OPEN-AIR SCHOOLS, 1091-1097.
Oppenheimer, *Miss* C. P., 116 (68).
Ordahl, George, 882.
ORGANIZATION OF SCHOOLS. *See* SUPERVISION AND ORGANIZATION.
ORIENTALS, 1496.
Ormsby, F. B., 634.
ORPHANS, 1500.
Orr, Charles, 1028.
Orr, William, 1112 (5).
Ort, S. P., 1364.
Orton, G. W., 1139.
O'Shea, M. V., 56, 412, 1175.
Osuna, Andrès, 483.
Ousley, Clarence, 95 (7).
Ovington, May W., 1494.
Owen, R. L., 96 (17).
Owens, C. J., 116 (10), 757.
Oxford university, 1611.
OXFORD UNIVERSITY, 889, 1289, 1603-1614. *See also* RHODES SCHOLARSHIPS.
Oxford university. Brasenose college, 1612-1613.

Pace, E. A., 1620.
Paddelford, F. L., 1365.
Paetow, L. J., 196.
Page, A. W., 813.
Page, L. A., 1428 (3).
Palmer, G. H., 671, 1226.
Palmer, Luella, 531.
Pam, Max, 1242.
PANAMA, education, 266.
Pannwitz, Rudolf, 350, 413.
Paolucci, A., 185.
Parayre, R., 1275.
PARENTS' ASSOCIATIONS. *See* HOME AND SCHOOL.
Parents' national educational union, 1107.
PARIS. UNIVERSITY, 1621.
Parish, *Miss*, 1187 (6).
Park, J. C., 1312 (1).
Park, *Mrs.* R. E., 95 (12).
Parker, S. C., 542.
Parker, W. H., 1029.
Parkinson, W. D., 532.
PARKS. *See* PLAYGROUNDS.
Parlin, C. C., 654.
Parlin, F. E., 533.
Parris, Marian, 1463 (4).
Parry, E. A., 414.
Parsons, Belle R., 1001.
Parsons, *Mrs.* Clement, 1187 (8).
Parsons, H. G., 51, 1107.
Parsons, Herbert, 1207.
Partridge, G. E., 484.
PATERSON SCHOOL, N. C., 1407.
Pattee, F. L., 1266.
Paulsen, Friedrich, 376.
PAUPERS, 1500.
Payne, A. F., 1314 (11).
Payne, B. R., 1243.
Payne, E. G., 303.
Payot, Jules, 485.
Peabody, Endicott, 1171.
PEACE, 1279-1285.
Pearls, H. B., 1488 (2).
Pearce, H. J., 116 (64).
Pearse, C. G., 107 (48).
PEDAGOGICAL DEPARTMENTS, college, 785-791.
Peeters, Edward, 311.
Peirce, W. F., 800 (1).
Pell, R. P., 116 (23).
PENMANSHIP, 621.
Penn, W. F., 1526 (2).
Pennsylvania educational commission, 920; state educational association, 159.
PENNSYLVANIA. UNIVERSITY, 869; School of observation, 1050.
PENSIONS, teachers. *See* TEACHERS, salaries and pensions.
PERIODICALS, 61-72.
Perry, A. C., *Jr.*, 543.
Perry, A. T., 798 (2), 814.
Perry, C. A., 55, 241, 1182.
Perry, C. F., 798 (8), 1313 (17).
Perry, F. M., 815.
Perry, T. D., 1030.
Perry, W. S., 1430, 1432 (7).
Pessels, C., 672.
Pestalozzi, J. H., 378.
PESTALOZZI, J. H., 377-379.
Peters, F. N., 719.
Petit, Édouard, 415.
Pettit, W. W., 1488 (3).
PHILADELPHIA, Central high school, 1578; education, 1529, 1532.
Philadelphia league of home and school associations, 1188.
PHILIPPINE ISLANDS, 1368, 1488 (3).
PHILIPPINE SCHOOL OF ARTS AND TRADES, 1354.
Phillips, C. A., 597.
Phillips, J. H., 116 (7).
PHYSICAL EDUCATION, 107 (122-127), 116 (58), 1045 (2), 1045 (5), 1063, 1120-1147; blind, 1045 (7); colleges, 1142-1147; deaf, 1045 (7-8); public schools, 1045 (9), 1134-1141.
PHYSICS, 724-728, 890, 893, 899.
PHYSIOGRAPHY, 701.
PHYSIOLOGY AND HYGIENE, 107 (10-11), 615-616, 741-748, 1045 (18), 1045 (22).
Pickhardt, Lila, 1452 (10).
Pinchot, Gifford, 95 (9), 1149.
Pinnarò, Gabriele, 1031.
Pitkin, W. B., 763.
Plaisted, L. L., 534.
Plass, Louis, 1537.
Playground association of America, 1112.
PLAYGROUNDS, 1112-1119.
PLAYS, GAMES, ETC., 112 (11), 116 (63), 513, 998-1001, 1045 (4), 1045 (6), 1045 (12), 1045 (21), 1112 (12), 1526 (9).
Plecher, Hans, 456.
Pleins, L. H., 1032.
POLITICS, teaching, 886.
Pomatto, Lorenzo, 416.
Ponzetti, G., 457.
Porter, D. R., 1244.

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PORTO RICO, education, 107 (7), 1488 (5).
Poteat, E. M., 116 (25).
Potter, M. C., 107 (44).
POTTERY, 1321.
Pouget, Auguste, 316.
Pound, J. M., 95 (4)
Powell, B. E., 655.
Powell, E. P., 959.
Powell, J. R., 116 (40).
Powell, Susie V., 560.
Powers, J. N., 96 (4), 96 (27), 758.
PRECEPTORIAL SYSTEM, 855-857.
Pressland, A. J., 321.
Price, Beulah M., 1108.
PRIMARY EDUCATION, 116 (60), 133 (14), 522-523, 529, 534-536, 1313 (20). *See also* ELEMENTARY EDUCATION; KINDERGARTEN.
Prince, J. T., 242, 914.
PRINCES, education, 1541.
PRINCETON UNIVERSITY, 813, 855, 857.
PRINCIPLES AND PRACTICE OF TEACHING, 429-466.
Pritchett, H. S., 221, 794 (5), 797 (3), 816, 1439 (5), 1440 (2).
PRIVATE SCHOOL EDUCATION, 796 (5), 1170-1173.
PROFESSION, CHOICE OF. *See* VOCATIONAL DIRECTION.
PROFESSIONAL EDUCATION, 1426-1462.
PROFESSORS, 775, 793 (1), 806, 808, 116 (23); salaries and pensions, 133 (4), 827-842.
PROMOTION OF PUPILS, 946, 1004-1005. *See also* GRADING; RETARDATION OF PUPILS.
PROVIDENCE, school census, 1200 (4).
Pruneda, Alfonso, 1059.
PSYCHOLOGY. *See* CHILD PSYCHOLOGY; EDUCATIONAL PSYCHOLOGY.
PSYCHOLOGY, teaching, 876.
Public education association of Worcester, Massachusetts, 160.
PUBLIC SCHOOLS, United States, 233-249.
PUNISHMENT, 996-997.
PUPIL SELF-GOVERNMENT, 116 (22), 800 (5), 812, 1020-1021.
Purcell, F. A., 92 (2).
Purinton, D. B., 1161.
Pusey, W. A., 1438 (12).
Putnam, G. A., 1396 (2).

QUAKERS, education, 1277.
Quandel, R., 417.
QUEENSLAND, secondary education, 348.

Radcliffe, P. R., 116 (39).
Radlmaier, Lorenz, 380.
Rae, Mabel, 1086.
Raikes, Elizabeth, 353.
Randall, A. G., 1499 (8).
Randolph, C. F., 272.
Rankin, Julia T., 116 (12).
Rankin, W. S., 1082.
Rapp, E. M., 1308.
Rathmann, C. G., 1327.
Rausch, Erwin, 186.
Ray, Julien, 1545.
Raycroft, J. E., 1045 (9).
READING, 73 (5), 576-579.
Reading, Pa. Board of education, 1328.
Reber, L. E., 793 (2), 1428 (6), 1552.
RECITATIONS, class room, 116 (39).
RECREATION, 998-1001.
Reed, C., 1314 (10).
Reeder, R. R., 1500.
Reese, Cara, 1033.
Reeve, A. B., 257.
Reiff, Ellen, 116 (59).
Reigart, J. F., 1019.
Reimann, Carl, 199, 1423.
Rein, Wilhelm, 459.
Reinsch, P. S., 338.
Reitler, Janette, 1313 (8).
RELIGIOUS EDUCATION, 1232-1278.
Religious education association, 1232.
RELIGIOUS PEDAGOGY. *See* SUNDAY SCHOOLS.
Rennie, John, 611.
Renshaw, J. H., 1363 (6).
Repplier, Agnes, 1479.
RETARDATION OF PUPILS, 107 (18), 159c (2), 159e (5), 159f (5), 1005-1018. *See also* BACKWARD CHILDREN; PROMOTION OF PUPILS.
Retortillo y Tornos, Alfonso, 523.
Reuschert, E., 1519.
REWARDS AND PUNISHMENTS, 996-997.
Reynolds, J. H., 116 (53), 1573.
Rhees, Rush, 150 (6), 1339 (2).
RHODES SCHOLARSHIPS, 175 (27), 843, 1285.
Ribera, Julián, 418.
Richards, C. R., 33, 1366.
Richards, Ellen H., 107 (74), 107 (100), 153 (10).
Richards, Laura E., 1506.
Richards, T. W., 729 (1).
Richardson, M. W., 664.
Richey, J. B., 107 (15).
Richman, Julia, 107 (25).
Riemer, Eugen, 1424.
Rigillo, Michele, 1393.
Riley, F. L., 116 (5).
Ritchie, J. W., 1060.
Rivington, J. A., 1267.
Rix, F. R., 635.
Roberts, W. W., 258.
Robertson, J. W., 107 (6).
Robertson, T. D., 1172.
Robinson, A. T., 673.
Robinson, C. M., 1118.
Robinson, G. B., 1526 (15).
Robinson, J. H., 1367.
Rochester, board of education, 1183; league of civic clubs, 1184.
ROCHESTER, factory school, 1339 (7); social centers, 1112 (18), 1181, 1183-1185.
Roeschlaub, R. S., 1084.
Rogers, J. M., 243.
Rogers, John, 1440 (6).
Rollins, Frank, 665.
Ropes, J. H., 1553.
Rose, Wickliffe, 116 (15).
ROSE POLYTECHNIC INSTITUTE, 1533a.
Ross, D. W., 1432 (1).
Rotch, T. M., 1045 (24).
Row, R. K., 1329.
Rowe, H. M., 105 (115).
Rowe, L. S., 179 (22).
Rowe, S. H., 29, 121 (7), 486.
Rowland, P. F., 346.
Roy, Dunbar, 116 (17).
Roy, V. L., 107 (39).
ROYALTY, education, 1541.

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Rude, Adolf, 544.
Ruediger, W. C., 11, 73 (6), 419.
Rüttgers, Severin, 580.
Ruggles, C. O., 781.
Ruhl, Arthur, 1173.
Ruiz Amado, Ramón, 420.
Rule, Lillian, 116 (60).
RURAL SCHOOLS, 78 (6), 96 (6-9), 107 (60), 116 (1), 116 (36-37), 119 (4), 134 (26), 144 (7), 144 (13), 144 (16), 144 (18), 147 (1), 147 (3), 154 (5), 155 (10), 155 (32-36), 159 (8), 168 (5), 168 (19-25), 175 (20), 547-566, 780, 988-991, 1009, 1066, 1308, 1312 (6), 1398 (1), 1491. *See also* INDUSTRIAL EDUCATION, rural schools.
Russell, H. G., 1409.
Russell, H. L., 96 (19).
Russell, J. E., 1384.
Russell, Martha M., 1452 (5).
Russell, W. E., 78 (11).
RUSSIA, education, 319-320, 900 (2).

Sabin, Henry, 368.
Sachs, Julius, 59, 656.
Sadler, M. E., 369, 503, 1246.
Sage, E. C., 73 (7).
SAILER, J. M., 380.
St. John, E. P., 57, 1210.
ST. PAUL'S SCHOOL, 1615.
SALARIES, teachers. *See* TEACHERS, salaries and pensions.
Salmon, David, 291.
Sanders, T. E., 769.
Sanderson, E. D., 1398 (6).
Sandiford, Peter, 931.
Sandison, Howard, 460.
Sargent, D. A., 1045 (17), 1144.
Sargent, Walter, 1314 (7), 1330, 1385-1386, 1432 (9).
SARGENT INDUSTRIAL SCHOOL, 1343.
Schaeffer, N. C., 107 (60), 159 *e* (7), 159 *f* (5), 159 *g* (4), 561, 921.
Scharrelmann, H., 421.
Schauffler, R. H., 1150.
Scheer, Meyer, 1368.
Scherer, H., 598.
Scheuer, Oskar, 1617.
Schiele, F. M., 187.
Schiffels, J., 16.
Schiner, Hans, 38, 1535.
Schlockow, Oswald, 599.
Schmidt, Emil, 585.
Schmidt, L. F. K., 1035.
Schmidt, O., 296.
Schmitt, Clara, 1015.
Schneider, Herman, 1363 (2), 1369, 1432 (26).
SCHOLARSHIPS, 843-845. *See also* RHODES SCHOLARSHIPS.
SCHOOL ARCHITECTURE AND EQUIPMENT, 124 (8), 1022-1044, 1092.
SCHOOL BOARDS. *See* SUPERVISION AND ORGANIZATION.
SCHOOL-BOOK QUESTION, 986-987.
SCHOOL CHILDREN, FOOD FOR, 1077-1080.
SCHOOL GARDENS, 78 (7), 607, 641, 1098-1111.
SCHOOL GOVERNMENT, 906-1169.
SCHOOL-HOUSES. *See* SCHOOL ARCHITECTURE AND EQUIPMENT.
SCHOOL HYGIENE, 78 (2), 107 (10-11), 107 (30-32), 1045-1097.
SCHOOL JOURNEYS, 595.
SCHOOL LAW *See* LEGISLATION, LAWS.
SCHOOL LIBRARIES. *See* LIBRARIES AND SCHOOLS.
SCHOOL MANAGEMENT. *See* DISCIPLINE; SCHOOL GOVERNMENT.
SCHOOL RECORDS AND REPORTS, 978-1021.
SCHOOL-ROOM DECORATION, 1044.
Schoolmasters' association of New York and vicinity, 161.
Schorn, August, 188.
Schrader, C. L., 1119.
Schumann, Georg, 1520.
Schumann, Paul, 1520.
Schurman, J. G., 797 (1), 1167, 1439 (6).
Schussman, L. G., 746.
Schuyler, Montgomery, 1037.
Schuyler, William, 116 (38).
Schwabe, Ernst, 304.
Schwarz, Hermann, 305.
Schwatt, I. J., 712.
Schwender, Jakob, 579.
SCIENCE TEACHING, 73 (1), 92 (3), 107 (128-135), 714-740.
Scotch education department, 632.
SCOTLAND, higher education, 884.
Scott, C. A., 1176.
Scott, F. N., 798 (5).
Scott, T. P., 116 (30), 657.
Scott, W. A., 1260.
Scudder, M. T., 562.
SECONDARY EDUCATION, 107 (19-21), 107 (75-83), 116 (28-33), 116 (35), 116 (38), 116 (40), 116 (67), 642-759, 794 (5), 798 (1).
Seerley, H. H., 107 (62), 107 (89), 107 (162), 960, 1045 (3).
Seidel, R., 379.
Selbey, A. D., 1397 (12).
Selden, F. H., 1331-1332, 1370.
SELF-EDUCATION, 1542-1572.
SELF-GOVERNMENT. *See* PUPIL SELF-GOVERNMENT.
Selvidge, R. W., 1314 (8), 1371.
Senier, Alfred, 310, 1394.
Sensor, T. D., 1312 (5).
Sercombe, P. H., 244.
Sergeant, Nettie C., 116 (4).
SEX EDUCATION, 161 (7-9), 744.
Shahan, T. J., 817.
Sharp, F. C., 107 (13), 1227.
Shaw, Albert, 1145.
Shepherd, J. W., 1109
Sherwood, H. F., 1410.
Shields, T. E., 422, 535-536, 581, 791, 1554.
Shipe, Maud M., 116 (63).
Shorrock, E., 961.
Show, A. B., 1247.
Showerman, Grant, 775.
Shull, C. A., 747.
Siders, W. R., 107 (17).
Siebert, Albert, 1131.
Siegert, Eduard, 190.
Silke, L. S., 1313 (9).
Simkins, J. D., 222.
Simmons, Kate C., 1432 (13).
Simon, Abram, 325.
Simon, Helene, 1080.
Simon, T., 1512.
Simoniadis, Jason, 900 (2).

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Simonson, R. B. D., 545.
Sinclair, S. B., 487.
Sipe, Susan B., 1110.
Sisson, E. O., 658, 1228.
Skinner, C. W., 1526 (9).
Skinner, Stella, 1432 (4).
Sleeper, H. D., 1455 (1).
Sloan, P. H., 1333.
Slocum, S. E., 709.
Slosson, E. E., 259, 818.
Small, W. S., 1045 (16).
Smith, Alexander, 897.
Smith, D. E., 130 (8), 620, 710.
Smith, Grant, 612.
Smith, Holmes, 1313 (3), 1314 (19).
Smith, H. L., 116 (20).
Smith, I. G., 423.
Smith, *Mrs.* K. W., 1198.
Smith, W. W., 116 (22), 1268.
Snedden, D. S., 159 *i* (9), 223, 260, 643 (3), 764, 962, 1309–1310.
Snow, Bonnie E., 149 (20), 1432 (28).
Snow, Mary S., 1314 (13).
Snow, T. C., 1290.
Snyder, E. R., 563.
Snyder, J. L., 1397 (7).
Soares, T. G., 1248.
SOCIAL CENTERS, SCHOOLS AS, 116 (46), 1181–1185. *See also* ROCHESTER, social centers.
Société des professeurs de langues vivantes de l'enseignement public, 674.
Society for the promotion of engineering education, 1428.
SOCIOLOGICAL ASPECTS OF EDUCATION, 1174–1207.
SOCIOLOGY, 887.
Sohon, M. D., 731.
Sollmann, T., 1438 (7).
SONGS. *See* MUSIC.
Sonnedecker, T. H., 800 (8).
Soper, M. B., 1432 (8).
Soule, A. M., 96 (9).
SOUTH AMERICA, education, 265, 268.
South Carolina state teachers' association, 162.
South Dakota educational association, 163.
Southern association of college women, 1465.
Southern California teachers' association, 164.
SOUTHERN EDUCATION BOARD, 95 (18).
Southern educational association, 116.
SOUTHERN STATES, education, 71, 95–96, 116, 119–120, 124, 127, 135, 143, 151–153, 162, 165, 167, 202, 210, 214, 225, 228, 230, 795–796, 1407, 1465, 1469.
Spanhoofd, Edward, 306.
SPECIAL CLASSES OF PERSONS, 107 (144–149), 1488–1541.
SPECIAL DAYS, 1112 (27), 1148–1150.
SPECIAL FORMS, RELATIONS, AND APPLICATIONS, 1170–1572.
Spranger, Eduard, 371.
Squire, Carrie R., 1016.
STAMMERING, 1089.
Stamper, A. W., 713, 765.
Stanton, Theodore, 1162.
Staples, O. B., 1179.
Starbird, Grace G., 1414 (1).
Starbuck, E. D., 853.
STATE AND EDUCATION. *See* EDUCATION AND THE STATE.
STATISTICS, 978–985.
Stearnes, R. C., 96 (26).
Stearns, Jane, 701.
Stearns, W. N., 819–820.
Stebbins, C. A., 613.
Stecher, W. A., 1045 (19).
Stedman, Mabel, 1140.
Steiger, K. F., 1313 (14).
Stern, Clara, 6, 511.
Stern, William, 6, 511.
Steuer, W., 711.
Stevens, E. L., 73 (12), 1061.
Stevens, F. L., 96 (20).
Stevenson, A. E., 1427.
Stevenson, J. J., 1146, 1163.
Stewart, J. S., 564.
Stimpfl, Joseph, 512.
Stockton, J. L., 575.
Stoddard, Cora F., 616.
Stoddard, F. H., 794 (7).
Stokes, A. P., 1594.
Stone, C. R , 1599.
Stoneroad, Rebecca, 1062, 1132.
Storey, T. A., 1063, 1147.
Storey, W. H., 119 (5).
Storms, A. B., 1397 (6).
Storr, F., 1291.
Story, A. J., 1521.
STORY TELLING, 112 (17), 1112 (16).
Stowe, Emma L., 1452 (9).
Strachan, Grace C., 976.
Strayer, G. D., 73 (8), 138 (3), 138 (10), 140 (3).
Strayer, P. M., 1339 (5).
Strong, John, 285.
Strong, Josiah, 157 (8).
Strümpell, Ludwig, 997.
Struthers, John, 1570.
STUDENT LIFE AND CUSTOMS, 1151–1169.
Studer, Paul, 322.
STUDY, METHODS OF, 121 (7), 467–468.
Sturdy, W. A., 224.
SUMMER SCHOOLS, 1548–1549.
SUNDAY SCHOOLS, 1264–1268.
SUPERVISION AND ADMINISTRATION, higher education, 846–854.
SUPERVISION AND ORGANIZATION, 107 (15–47), 107 (63), 159 (1), 159 *b–g*, 937–991, 1200 (4).
Sutherland, W. J., 27, 600.
Sutton, W. S., 370.
Swain, Joseph, 794 (2), 1249.
SWITZERLAND, education, 321–322.
Sylvester, Emma, 614.
Sylvester, F. O., 1313 (4).

Talbot, H. P., 732.
Talbot, Marion, 1480.
Tall, Lida L., 692.
Taussig, A. E., 1083.
Taylor, F. W., 1428 (5).
Taylor, J. S., 586, 593.
Taylor, W. J., 189.
TEACHERS, efficiency, 116 (48); in fiction, 773–775; institutes, 766–767; international exchange, 792, 830 (1); qualifications, 73 (6), 107 (44); salaries and pensions, 107 (39), 970–977, *see also* PROFESSORS, salaries and pensions; training, 760–792, 1045 (16)

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TEACHING. *See* PRINCIPLES AND PRACTICE OF TEACHING.
TEACHING, as profession, 768–772.
TECHNICAL EDUCATION, 799 (2), 1388–1395, 1428. *See also under countries.*
TEETH, hygiene, 1084–1086.
Tennessee public school officers' association, 165.
Termaat, Minnie I., 601.
Terry, C. T., 1437.
TEXAS, education, 95 (7), 124, 922.
TEXT-BOOKS, 986–987.
THEOLOGY, 92 (1), 1459–1462.
THEORY OF EDUCATION, 116 (49), 381–428.
Thiergen, Oskar, 792.
Thollon, B., 1522.
Thomas, D. Y., 225, 1573.
Thomas, H. A., 1250.
Thomas, Isaac, 1251.
Thomas, J. F., 963.
Thomas, J. M., 771, 821.
Thomas, M. Beatrice, 714.
Thompson, A. C., 107 (42).
Thompson, A. H., 1596.
Thompson, C. Mildred, 693.
Thompson, F. V., 759.
Thompson, J. G., 782.
Thompson, W. O., 107 (65), 659, 1261.
Thomson, L. S., 1432 (12).
Thorndike, E. L., 22, 73 (2), 73 (10), 488, 489, 621, 1005, 1017.
Thum, William, 424.
Thwing, C. F., 883, 987, 1164, 1627, 1628.
Tighe, R. J., 116 (13), 116 (45), 153 (8).
Tirrell, H. A., 245.
Tobey, E. N., 1450.
Tombo, Rudolf, *jr.*, 261, 262, 273.
Tomlins, W. L., 107 (28).
Torek, F. J. A., 1525 (1).
Toulouse, Édouard, 425.
Townsend, Wallace, 116 (31).
Tracy, Frederick, 487, 512.
TRADE EDUCATION, 116 (56), 149 (29), 798 (8), 1313 (17), 1335–1387.
Tredgold, A. F., 1538.
Trotto, Pietro, 317.
TRUANCY. *See* ATTENDANCE, SCHOOL; BACKWARD CHILDREN; MORALLY DEFECTIVE CHILDREN.
True, A. C., 1397 (1), 1397 (5).
TUBERCULOSIS, 1087–1088.
Tucker, W. J., 772, 1165, 1177, 1262.
Tuckerman, Julius, 78 (5).
Tuczek, F., 461.
Tufts, J. H., 822, 1229.
TURKEY, education, 323–324.
Turneaure, F. E., 1428.
Tyler, J. M., 537.
TYPES OF EDUCATION, 1286–1462.

UNGRADED SCHOOLS, 1526 (6).
UNIT SYSTEM, 794 (3–4), 860, 862.
UNITED STATES, educational legislation, 906–928; elementary education, 539–641; higher education, 250–263, 793–899, 905; history of education, 200–263; secondary education, 73 (12), 116 (28–30), 159 *h–i*, 642–759.
United States Bureau of Education, 7, 40, 46, 179, 797 (4), 797 (5), 965–969; library, 107 (40).
United States Department of Agriculture, 47.
United States Office of experiment stations, 1411.
UNIVERSITIES AND COLLEGES, 816, 1280 (2, 3, 4, 6), 1284; Austria, 1617; Belgium, 1618–1620; Egypt, 1628; Europe, 273; France, 1621; Germany, 309, 1622–1625; Great Britain, 1595–1617; India, 1627; Italy, 1626; religious education, 1252–1263; state, 810, 820; United States, 73 (7), 73 (8), 95 (16), 96 (10), 107 (23), 1573–1594. *See also* HIGH SCHOOL AND COLLEGE; NORMAL TRAINING, universities.
UNIVERSITY EXTENSION, 793 (2), 1428 (6), 1550–1554.
Upham, A. H., 1585.
Upton, D., 1314 (12).
Urquhart, W. S., 339.

Vaile, H. S., 1571.
Vaile, P. A., 844–845.
Valente, Pompeo, 292.
Van Cleve, E. E., 130 (3).
Van Cleve, E. M., 107 (147).
Van der Hayden, Joseph, 1462.
Van Dyke, Henry, 226.
Van Dyke, Paul, 823.
Van Hise, C. R., 95 (16), 263.
Van Kleeck, Mary, 1425.
Vargas, Moises, 268.
VASSAR COLLEGE, 1589.
Vaughan, V. C., 1439 (7).
Venable, F. P., 796 (1), 824.
VENTILATION, school-houses, 1038–1040.
Verein für wissenschaftliche pädagogik, 462.
Vermont state teachers' association, 166.
Verworn, Max, 720.
Vetterlein, E. F., 1036.
Vidotto, G., 34, 318.
VIENNA. UNIVERSITY, 1617.
Virginia state teachers' association, 167.
VOCATIONAL EDUCATION, 644 (4), 799 (4–5), 908 (2), 1293–1311, 1387, 1432 (18), 1432 (27).
Vose, G. H., 1339 (10).
Votaw, C. W., 1211, 1230.
Vuyst, Paul de, 1412.

Wade, F. B., 733.
Wade, H. T., 862.
Wagner, A. E., 1018.
Wahlstrom, L. W., 1313 (19).
Waitz, Theodor, 463.
Wald, Lillian D., 1112 (27), 1201, 1452 (13).
Walden, J. W. H., 28, 193.
Waldorf, Lee, 464, 766.
Waldstein, Charles, 1187 (14).
Walker, C. H., 1313 (1).
Walker, J. C., 796 (5).
Wallin, J. E. W., 37, 985, 1074–1075.
Walter, H. E., 738.
Ward, E. J., 1112 (18), 1185.
Warren, G. F., 1398 (4).
Warren, Irene, 20.
Warriner, E. C., 1387.
Washington, B. T., 163 (6), 1495.
Washington (State) Dept. of education, 227.
Washington educational association, 168.
Waterman, Hannah P., 78 (8), 1398 (3).
Waters, H. J., 1397 (9), 1413.
Watson, Foster, 282, 374, 426.
Watt, W. E., 1039, 1045 (15), 1045 (21).

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Weakley, Janet, 636.
Weaver, E. W., 644 (4).
Webb, Helen, 1187 (3).
Webster, G. W., 1438 (14).
Webster, H. J., 1311.
Webster, W. F., 246.
Weed, C. M., 1111.
Wehrhan, Karl, 427.
Weimer, Solomon, 1547.
Welch, H., 800 (5).
Welsh, Trevor, 1482.
Welton, James, 60, 465, 1281.
Wenley, R. M., 884, 1263.
Wernicke, Alexander, 307.
Wesbrook, F. F., 1438 (13).
WESLEYAN UNIVERSITY, 1590.
West, *Miss* C. L., 1432 (17).
West, H. S., 116 (3).
WEST POINT MILITARY ACADEMY, 1143.
West Virginia university, 169.
Western drawing and manual training association, 1313–1314.
Weston, S. F., 800 (7).
Wheeler, Mary C., 1432 (14).
Whipple, G. M., 53, 1064.
Whitcher, G. H., 78 (12).
White, A. D., 1280 (2), 1280 (3).
White, Jessie, 721.
White, W. T., 116 (66).
Whitehead, R. H., 1438 (16).
Whitfield, H. L., 546, 767, 1372.
Whitney, Worrallo, 722.
Whitsit, J. E., 734.
Whittemore, G. E., 1200 (4).
Wickson, E. J., 1397 (11).
Wiebe, Edward, 538.
Wigmore, J. H., 1432 (2).
Wiley, H. W., 1286.
Willett, H. L., 1276.
Williams, Ada, 1312 (6).
Williams, Harold, 1451.
Williams, James, 287.
Williams, S. H., 1334.
Williams, T. A., 1045 (13).
Williams, W. M., 854.
WILLIAMS COLLEGE, 1591–1592.
Willmann, Otto, 351.
Willoughby, W. F., 1488 (5).
Wilson, B. N., 1373.
Wilson, J. M. 286.
Wilson, L. N., 1572.
Wilson, Lucy L. W., 625.
Wilson, Woodrow, 145 (4), 428, 643 (2), 793 (3), 825, 857.
Winch, W. H., 490.
Winchell, H. N., 1314 (3).
WINONA TECHNICAL INSTITUTE, 1363 (5).
Winship, A. E., 131 (3), 228, 229, 247–248, 283, 565, 783–784, 977.
Winter, Richard, 1133.
WISCONSIN, education, 96 (19), 924–928.
Wisconsin teachers' association, 170.
WISCONSIN. UNIVERSITY, 1486.
Wise, S. S., 1199.
Withers, J. W., 107 (38).
Wittich, George, 1045 (7), 1141.
Wolcott, J. D., 17, 230.
Wolfe, L. E., 964.
Wolze, C., 308.
WOMAN'S NATIONAL COUNCIL OF EDUCATION, 1475.
WOMEN, agricultural education, 1396; domestic science, 134 (32), 1423–1425; education, 95 (10), 95 (13), 96 (3), 107 (168–171), 119 (34), 127 (3), 168 (16), 643 (3–4), 1197, 1463-1487; higher education, 1469, 1477; industrial education, 119 (23), 1339 (3), 1466–1467; physical education, 1122, 1132, 1136; teachers, 770, 976. *See also* NURSES, training.
WOMEN'S CLUBS AND EDUCATION, 95 (11–12), 96 (15), 116 (45), 152 (5), 1396 (2–3).
Women's educational and industrial union, Boston, Mass., 1466–1467.
Wood, F. A., 1589.
Wood, H., 1314 (5).
Wood, T. D., 54, 1065–1066.
Woodbridge, S. H., 1040.
Woodbury, Sarah E., 10, 626.
Woodhull, J. F., 723, 899.
Woodley, O. I., 107 (41).
Woodward, C. M., 798 (6), 799 (1), 1313 (16).
Woodward, Cora S., 1168.
WOODWORK, 1319.
Woolman, Mary S., 1339 (3), 1374.
Working, D. W., 1396 (1).
Wright, C. T., 995.
Wright, J. D., 1523.
Wright, Sarah M., 249.
Wuerpel, E. H., 1313 (5), 1313 (7).
Wyeth, J. A., 1440 (3).
Wylie, F. J., 1285.

YALE UNIVERSITY, 359, 841, 1593–1594.
Yates, J. S., 587.
Yetter, J. M., 232.
Yocum, A. D., 869.
Young, Ella F., 660.
YOUNG MEN'S CHRISTIAN ASSOCIATION, 1112 (24–26) 1278.
Younger, Alice, 1180.

Zapffe, F. C., 1440 (5).
Zauck, Carl, 1487.
Zeller, J. W., 566.
Zenner, Philip, 748.
Zentler, Arthur, 1525 (5).
Zenz, Wilhelm, 190.
Ziebarth, Erich, 194.
Ziegler, Theobald, 191, 466.
Zielinskiĭ, F. F., 1292.
Ziertmann, Paul, 826.
Zimmerman, O. B., 1428 (13).
ZOÖLOGY, 739–740.

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